HOUSE OF LORDS

SESSION 1987–88
3rd REPORT

SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

PRIORITIES IN MEDICAL RESEARCH

VOLUME III — WRITTEN EVIDENCE

Ordered to be printed 1 March 1988

LONDON
HER MAJESTY'S STATIONERY OFFICE
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*Denotes also gave oral evidence (see Volume II)

WRITTEN EVIDENCE

Letter from Dr. A. A. J. Adgey, Regional Medical Cardiology Centre, Belfast

Thank you for your letter of 3 March 1987 regarding "Sub-Committee II—Medical Research" and the priorities in medical research.

For the past 20 years my field of research has been in out-of-hospital or mobile coronary care. I have been involved in clinical and basic research in this area. I have helped define the problems of sudden death i.e. ventricular fibrillation including the alterations of heart rhythm prior to ventricular fibrillation, the effectiveness of drugs in the early phase of myocardial infarction, the pharmacological limitation of muscle necrosis secondary to coronary artery occlusion and defibrillation of ventricular fibrillation. This research has been translated not only into pharmacological developments but also the automatic detection of ventricular fibrillation and defibrillation are now possible. The optimisation of first shock success in patients with ventricular fibrillation is paramount in improving success rates of defibrillation along with reduction in heart damage. It is in this area that in conjunction with a physiologist and bioengineer I have contributed to the development of different types of defibrillation systems which are now commercially available.

In answer to your nine questions:

(a) The determinants of research priorities are, in the main a blend of the motivation of individual researchers; the emotional impact of different disease states and, of increasing importance, the effects of media pressure. Individual researchers are to a significant extent swayed by the weight attached by career appointment panels to a period spent in research during training, and not primarily by a burning desire to study some particular problem. The influence of private charitable research organisations is, however, very important, since their priorities do, to a large extent, reflect the perception by the public of their needs. These are not, however, necessarily synonymous with the needs of the National Health Service.

(b) If the factors which currently determine research priorities are complex, as has been suggested, then it follows that the present balance is probably not right. Such a statement does, however imply a knowledge of what is "right", of what programmes should be cut back and what should be given a higher priority. Rationally such considerations should involve questions of morbidity and its economic consequences; mortality; and, in particular the possibility of a much greater role for prevention ramifying into the area of public health and the most effective ways in which the public might be educated in health matters. The key issue must be an attempt to set national research priorities. If such a consensus on research priorities could be reached then it would be relatively independent of the level of resources. An increase in resource availability would simply permit an expansion of effort to embrace lower priority programmes.

(c) Priorities do adapt to changing incidence of disease—perhaps not always logically. The topical example is the AIDS problem. Here topicality, heavily fanned by intense media preoccupation, has elevated a problem at present circumscribed, albeit with dire potential, into the highest priority category. Other factors can result in a change in priorities—thus the popular concentration on "new technology" tends to make the technology an end in itself. Then the understandable motivation of specialist groups e.g. computer experts can result in the elevation of computer research in the list of priorities without regard to its importance in the range of national health priorities.

(d) It was earlier suggested that private charitable funding can support research not necessarily related to nationally agreed priorities. Similarly, the particular interests of the pharmaceutical industry, while in many ways beneficial in its research funding policy, are not inevitably amenable to prioritisation based on the good of the National Health Service. To the extent that these private and commercial sources fail to address aspects of health high on the list of national priorities, it should follow that public funding should be organised so as to attempt to redress the balance.

(e) The very proliferation of learned journals through which the results of research are disseminated has resulted in a degree of specialisation and compartmentalisation which militates against cross-disciplinary spread. However the more recent development of readily accessible databases is beginning to improve this situation.

(f) The different sources of research funding with their inevitably different motivations can lead to significant duplication of research effort. In a free society this is unavoidable but rapport between the various funding agencies goes some way to limit the worst effects. The establishment and maintenance of a national register of medical research would go some way to inform the various funding agencies of ongoing research in their fields.

(g) There is an inevitably long lead time before the results of medical research are translated into patient care and health education. Research findings are often controversial, and, in addition, very proper concern for patient safety can require a long period of evaluation before the results are applied in the care of patients or into the health education process. Clearly this delay is essential, even if, with hindsight, valuable research findings are seen to have been applied later than might have been possible.

(h) The training of medical researchers must, as for all research workers, involve the inculcation of scientific method, and, in particular the importance of rigorous validation of the findings before publication. Much medical research is currently undertaken because of a perception that research publications confer career benefits on the researcher. It is perhaps questionable whether such motivation is ideal, and whether a "research year" during postgraduate medical training inculcates, or even involves an appreciation of research method.

(i) As indicated earlier, the development of an agreed set of priority areas for research, and the use of public funding to steer work into these areas, would significantly improve the applicability of research findings. The quality of research is so inherently dependent on the quality of researchers that any system of funding will ultimately direct funds to research groups with proven records. However the organisation of research centres such as existing MRC specialist units, can ensure that the individual researcher is provided with the best infrastructure in which to develop his potiential.

I think that the problems identified in the previous Report on Civil Research and Development are very similar to those found in medical research. Too many approved medical research projects go unfunded in this country, particularly projects from well recognised research units.

I hope that the Committee will find this evidence useful.

A A J Adgey MD FRCP FRCPI FACC

April 1987

Memorandum by Professor A G Alexander, University College and Middlesex School of Medicine, University of London

Dental research in the United Kingdom is carried out largely in the Dental Schools and their associated Dental Hospitals. It is undertaken mainly by University staff and their research assistants and students, and to a lesser extent by NHS Consultant and Junior Staff. Dental teachers have much less time to devote to research than almost any other university discipline because of their intensive involvement in the chairside teaching of undergraduate students and the heavy service load which they carry. Many teachers, especially in the restorative disciplines, have as little as a day each week which they can devote to research. Clinical teachers are required to follow similar training pathways to their NHS counterparts in order to become accredited and be eligible for appointment to honorary consultant status. This heavy burden leaves little time for research in what should be one of the most productive periods of a teacher's career. It also leaves little time for formal training in research methods.

The dental course is of necessity largely vocational in nature. The opportunity of intercalating a BSc degree is made difficult because a student would need to take an additional two years, whereas a medical student only has to do one additional year. In consequence very few dental graduates have a sound basic training in science at the University College and Middlesex School of Dentistry. The new dental curriculum will include an almost completely common first-year teaching programme for dental students and medical students as well as a second full year largely devoted to pre-clinical and para-clinical teaching; which, in turn, will allow the School of Dentistry to offer a valuable option for just a single year's extra pre-clinical study leading to an Intercalated BSc degree.

Attracting external funding for dental research has always been a problem since dentistry is not a subject that readily catches the imagination of industry or the research councils, especially when there is direct

competition with Medicine. The dental manufacturing industry in this country is small and not able to give much financial backing. Firms manufacturing dental health care products such as toothpastes and toothbrushes are more able to support research but they select those projects that are of direct relevance to their own products. Manufacturers of dental restorative materials conduct their own basic research and development studies but naturally try to keep some of the results secret for commercial reasons. At UCMSD we rely on UGC and DHSS sources to get our research started but, increasingly, we are attracting large sums from a variety of different sources currently approaching £1 million in the last two to three years against an annual UGC budget circa £900,000.

In spite of these problems a considerable amount of dental research *is* done. This can be judged by the recent Annual Meeting of the British Society for Dental Research which was held in London recently. 572 papers and poster demonstrations were given of which the majority came from dental schools. About five per cent were presented by workers from commercial firms such as Unilever and Beechams or from the Royal College of Surgeons of England. The main subject areas covered included the formation, mineralization, malformation and diseases of teeth; the biochemistry of healthy and diseased oral tissues; the microbiology and ecology of dental plaque; the materials used for restoring teeth; the epidemiological study of the incidence of dental diseases, the delivery of dental care, and clinical trials of preventive agents; the use of fluoride, fissure sealants and plaque controlling agents in the prevention of diseases and the diagnosis and treatment of periodontal diseases or systemic diseases with oral manifestations.

This is by no means the only showcase for dental research since this meeting is only one of many held during each year by the various specialist dental organizations. That society has benefited enormously from the results of such research can be judged by the dramatic improvement in dental health, dental materials and techniques that everyone who goes to a dentist regularly is well aware of.

At the University College and Middlesex School of Dentistry we have chosen to limit and, therefore, concentrate our research effort to teams of workers investigating a few main areas. This has allowed us to use the limited time and resources available for our senior and junior staff to the maximun and has kept our studies rolling. All full-time academic members of staff are expected to participate and some NHS staff and part-timers are also involved. There is extensive co-operative research activity with many other hospital and university departments, for example with Medical Physics, the Neonatal Unit, the Radiotherapy Unit and the Department of Psychiatry. We also collaborate with other Institutions in the University of London through the North London Consortium of dental schools and with Liverpool, Manchester, Newcastle and Cardiff Dental Schools and with the Royal College of Surgeons.

The research work is mainly of an experimental rather than a descriptive nature. Most of the projects have direct practical clinical applications that are relevant to NHS practice. Time does not allow me to do more than highlight some of the more important studies, but I hope these will give the Sub-Committee a flavour of their extent and sophistication, and the relevance to the NHS.

Professor Aubrey Sheiham is continuing his important epidemiological and sociological studies into systems of delivering dental care, into patterns of disease and manpower needs and the effectiveness of established methods of treating dental diseases. His work has been a major factor in changing our philosophy away from repair towards prevention and in bringing to light the problems of over-treatment in the NHS leading to the Schanshieff report.

The early detection of dental caries and periodontal disease is important in their prevention. A new study using imaging from radiographs with direct computer analysis is being done. This may help resolve the variability that has been shown to exist between individual dentists in diagnosing these diseases.

Professor Alan Boyde heads our world renowned Hard Tissue Unit. In addition to studying the skeleton he also includes studies of dental caries, periodontal diseases and metabolic bone disorders. The major part of this work has been based on a morphological and embryological approach with especial use of all of the techniques of scanning electron microscopy, an instrument which was pioneered in that Unit. Professor Boyde and his team have been using a new instrument called a Tandem Scanning Reflected Light Microscope to study the cutting of teeth and the adhesion of dental materials to the enamel and dentine. The instrument is unique in the United Kingdom and was the first microscope of its kind in the Western World when Professor Boyde obtained it from Czechoslovakia in 1984. It allows us to look below the surface of translucent objects such as teeth and produces high resolution images. This is ideal for looking at the junction between tooth coloured adhesive materials, dentine and enamel in near normal conditions without artefacts due to specimen preparation.

Techniques which have been developed at UCL give a better understanding of the reason for success and failure in adhesive filling materials. We are also able to observe the cutting of teeth with dental burs at 250 to 300,000 revolutions per minute at magnifications greater than x 1500, looking at the structure within the tooth as it happens. This would not be possible with any other microscope.

An excellent example of co-operative work of direct relevance to the NHS is that between our orthodontists, oral and maxillo-facial surgeons (who also work at Great Ormond Street) and the Depart-

ment of Medical Physics. They are using a low powered fanned light laser beam, that does not harm the eyes, to scan the head and produce digital signals for a computer system. The object is to produce three dimensional images to predict facial form following the surgical correction of orofacial deformities. This exciting work has involved developing a transputer system (this allows a computer to do several things at once) by the physicists that won an important award sponsored jointly by the INMOS electronic firm and the Electronic Times in conjunction with the Department of Trade. Considerable interest has been shown in this system by commercial firms. The novel techniques that this team are developing have wide applications, especially for the study of skull growth and the correction of facial abnormalities.

Another project that exploits the use of lasers has just been started. These lasers are being used to fuse glass onto the surfaces of teeth and so hopefully prevent those surfaces from developing dental caries.

In our joint department of Materials Science in Dentistry with the London Hospital Dental School, important research into developing and testing new materials both "in vitro" and "in vivo" is going on apace. Behavioural studies of dental anxiety, motivation, and the barriers to "self-care" are being carried out and a multi-disciplinary team is studying chronic facial pain. There are also studies of local anaesthetic agents, visual perception by dentists, treatment of cleft palates in neonates and dental health in Nigeria.

Professor Picton heads a long estabished team doing fundamental research into the mechanisms of tooth support. This presently involves the bio assay of the periodontal ligament correlated to its physical state. There are important clinical implications for this work not least in bridge and denture support. An eminent group of oral microbiologists is looking at acid production by oral streptococci in an artificial mouth and also testing compounds that potentiate the effects of fluoride ions on oral streps.

In addition, to the modest basic UGC support for all this work, additional money has been obtained from a variety of other sources including the North East Thames Regional Health Authority; the Special Trustees of UCH; industries such as the drug companies and materials manufacturers; from the MRC and the SERC; from the DHSS and from Faculty endowments funds.

Your Lordships, I hope that, in the short time available to me, I have given you an overview of dental research and how relevant it is to the needs of the NHS at University College and Middlesex School of Dentistry and UCH Dental Hospital.

April 1987

Letter from Professor H. Allred, The London Hospital Medical College, University of London

I apologise for writing to you after 1 October but a copy of your letter of 29 July, 1987 has only just come to hand. I appreciate that the Sub-Committee may be unable to receive further evidence but I am stimulated to write in view of the reference to the special needs of the NHS and the invitation for more evidence in the field of dental research.

In brief outline: I am Professor of Conservative Dentistry in the University of London at The London Hospital Medical College; I was for six years Dean of Dental Studies; I am on the UGC Dental Sub-Committee and a member of the UGC Dental Review Working Party; in the 1970's I established and Directed a DHSS funded Experimental Dental Care Project the work of which was reported in detail in "The Delivery of Dental Care"; and I have carried out a number of commissions for WHO and the Council of Europe concerned with the provision of dental care. There are two particular areas that I believe the Sub-Committee might consider:

— Health Service research into the provision of Oral Health Care;

— Educational Research into the role and education of Oral Health Personnel.

The future role of dentists and their educational needs, and those of auxiliary personnel has perhaps never before been in such a state of flux. As President of the Association for Dental Education in Europe I am only too well aware of the wide ranging problems facing the countries of Southern Europe and different ones in many Northern European nations. This country is, I believe, better placed than any other to establish significant research centres in the two areas referred to which would be sources of the sound data so desperately needed.

It is not appropriate or possible for me to expand further on these themes in this letter but I enclose for information:

— Assessment of the Quality of Dental Care 1977;

— A copy of a proposal I have submitted to the EEC Commission for the establishment of a European Dental Educational Research Unit which includes as an appendix a brief annotated Bibliography.

If I can be of any assistance to the Sub-Committee, please let me know.

H Allred

October 1987

Letter from Dr Sue Armitage, South Glamorgan Health Authority

I welcome the opportunity to comment with specific reference to nursing research.

I wish to make the following points with reference to the position of nursing research in general but therefore with implications for nursing research priorities.

In many instances, nursing research is disadvantaged by its minority position in relation to medical research in the membership of research committees and grant awarding bodies which are dominated by medical members with their associated different background and therefore interests.

No specific funding body for nursing research exists as does the Medical Research Council for medicine. The competition for nursing research funds is therefore fierce with the result that nursing research is likely to be constrained in its methodological approach and research design in order to conform to the expectations of committee members functioning very often within a different scientific paradigm. Nursing utilises a variety of theoretical perspectives but it is overridingly a practice based discipline and much of its developing theoretical knowledge rests on qualitative as well as quantitative research methods conducted in the field. Nursing research is still at an early stage of development. Replication of small scale studies and the testing of emergent knowledge against nursing practice is an important element in its furtherance.

In common with a number of other disciplines there is no clearly defined research career path and many experienced nurse researchers are surviving on short term contracts based on research grants which does little to encourage older and more experienced nurse researchers to remain within the field. Additionally, short term contracts result in a divergence of energies and resources in the later stages of each project in order to secure additional funding for the next. The establishment of further Nursing Research Units with a core of tenured posts would give greater security and retain experienced researchers.

Future nursing research needs to reflect the interest at the level of nursing practice and to provide an empirical basis for decision making for nurse managers. The feedback of nursing research findings to the clinical area requires to be supported by easier movement between the areas of practice, education and management for nurse researchers.

In response to the request of the Sub-Committee in the initial letter of March 1987 for those submitting evidence to describe their involvement in research I offer the following comments.

I am engaged in the support of nurses throughout the Principality of Wales in undertaking nursing research, in advising nurses on research and funding matters and in encouraging the utilisation of research findings related to nursing practice, education and nursing management. I am currently the grantholder for a research study which is examining the continuity of nursing care at the interface of hospital and community.

Dr Sue Armitage
All Wales Research Liaison Nurse

September 1987

Memorandum by The Arthritis and Rheumatism Council

Answers to the Questions contained in House of Lords' Science and Technology Committee's letter of 3 March, 1987

(a) The Arthritis and Rheumatism Council is a charity which raises funds for research into rheumatic diseases, most of which arise from unknown sources. Its priority is set accordingly. The success of the charity in raising funds indicates a health need of the nation and suggests a public perception of the inadequacy of current methods of treatment.

(b) see (a).

(c) By funding an epidemiological research unit, the Arthritis and Rheumatism Council ensures that its support for research is directly linked to the latest information about changing incidences of disease and population structures. However, research initiatives only too rarely find application in clinical rheumatology, because there is a lack of suitable NHS departments, and a general lack of political and financial support for these chronic diseases.

(d) Funding of research by the ARC already relieves public bodies, such as the Medical Research Council, of commitments which it would be appropriate for them to undertake. This is valuable in the short term, but creates a lack of balance in matters of funding and governance involving the ARC, the NHS and the UGC. Problems of this sort arise, for example, in applying the results of clinical and laboratory work by research fellows and academics supported by the ARC. The ARC avoids supporting research by commercial bodies which can in due course recoup their research costs.

(e) The amount of information transmitted usually exceeds the capacity of those needing the information to receive and assimilate it.

(f) Independent confirmation of research findings is an essential part of scientific progress. It is rare for medical research to "duplicate" research effort, and the opportunities are reduced by judicious choice of research projects for support.

(g) No, because insufficient funds are available for care of patients and for education about health.

(h) More opportunities are needed for suitable medical students to include one or more years of scientific training in their course, e.g. by an intercalated B.Sc. Less rigid requirements for achieving consultant status are essential if young medical graduates are going to develop research skills and advance knowledge without jeopardising their primary career.

(i) By more funding of research posts unhampered by clinical overload and by excessive teaching commitments.

Letter from Dr. M. Ashley-Miller, Nuffield Provincial Hospitals Trust

Thank you for your letter of 3 March informing me about the setting up of a Sub-Committee of the Select Committee on Science and Technology which is to consider priorities in medical research with particular reference to the needs of the National Health Service (NHS). I am grateful for the invitation to submit evidence.

In responding to the invitation I would wish to emphasise that my comments are strictly of a personal nature and do not reflect the views of the Trust. Rather, they are based on over 25 years experience of organising, developing and managing medical research whilst employed by the Local Authority on the Isle of Wight, on the head office staff of the Medical Research Council and most recently with the Chief Scientist Organisation of the Scottish Home and Health Department. I was appointed to the Secretaryship of this Trust in May last year and its aims are described in the attached short memorandum. The Trust has a broad remit to assist in the improvement of health services in the provinces; and recently the Trustees determined a special interest in the development and improvement of services for the physically disabled, including the frail elderly.

In the following sections I will attempt to respond to the Sub-Committee's various questions in the order posed:

(a)(d)(f) Priorities are set for two main reasons. First a research funding organisation has determined that there is a particular research need which is not being met and therefore assigns priority by specifically allocating funds in order to develop research in this area. The second reason is that organisations may find within their broad remit that there are insufficient funds to support all the research that they wish to sponsor; they therefore identify those areas which will have priority call on their funds.

Determining priority or special interest areas is a complex process and requires identification and definition of problems; of ways in which feasible research can contribute to their resolution; and of knowledge of related ongoing research supported by other bodies or research agencies (which may need to embrace international research). For example, the relatively modest research funding given for the field of "rheumatism" by the Medical Research Council, despite the huge burden of ill-health and disability posed by diseases in this broad category, can be more readily understood in the context of the very considerable research funds provided by the Arthritis and Rheumatism Council. On the other hand, the low level of support given to dermatological research is due to the extremely limited academic base for this subject.

Where research directly related to the health service is concerned, it is unfortunate that neither Regions nor Districts have access to research funds of any significance. Priorities for such research are set by Departments of Health/the MRC who do have such research funds. At times it is not apparent that priorities determined by the centre really reflect the needs and priorities of Health Authorities responsible for delivering services. Furthermore, over the past 20 years the main priority for developing a cadre of experienced health service research workers in the UK has not been pursued very effectively. Also, the lack of a career structure has not encouraged the retention of many of those who have been attracted to health services research.

(b) There are always individual programmes that should be cut back or stopped. On the whole, medical research funding agencies have a good record in determining priorities and in monitoring the research that they support to ensure that this is progressing satisfactorily. Although I am convinced that there must be an adequate balance between basic and applied medical research, I do question the proportion of the civil research budget devoted to fundamental research at the present time. In particular I would instance CERN. The more difficult and important problem is the determination of resources to be devoted to different branches of civil science, especially in relation to the amount spent on defence R & D.

(c) I think there is little doubt that medical research responds to changing situations, though at times this response may be considered rather too slow or inadequate. However this will remain so as long as scientists are relatively free agents who cannot be directed to work on particular problems. If researchers assess a problem as being either intransigent or only likely to yield results over a very long time span—and thus liable to affect their career because scientists have to produce results to gain recognition—they are unlikely to choose to work in such an area. In these circumstances funding agencies can however exert a significant influence in providing such a climate as to persuade researchers to investigate "unattractive" areas. Where a problem poses an intellectual challenge and requires the skills of "mainstream" disciplines, then there is little difficulty in securing a response. This is well illustrated by the willingness of workers to undertake research into the field of AIDS, despite the previous reluctance for workers to undertake research into venereal diseases.

(e)(g) In general terms the answer must be "yes"—except for that concerned with health service research. This tends to be multi-disciplinary in nature and its outcome is relevant to a different constituency—and dependent upon it for implementation. Furthermore, as noted above, much health service research is funded by Departments of Health and may not reflect the needs of Regions and Districts. One way of helping to overcome this would be the establishment of a recognised journal for publishing and transmitting health services research findings; but there is at present no such journal.

The very scale and cost of the health service means that any research which is widely applicable could result in very significant savings/improvement, even if only marginal gains in cost or quality of service terms are involved. However as individuals we are very reluctant to change our practices for gains of 1 per cent or 2 per cent. Indeed as far as doctors are concerned it would seem likely that a gain of over 10 per cent in effective treatment terms would normally be needed before significant numbers of clinicians would change their own practice. Thus research is not reflected in actual improvements in patient care or management to the extent that it should be.

(i) It needs to be clearly understood that a research funding agency that is commissioning research—i.e. not just acting "passively" in assessing and supporting unsolicited applications—must employ experienced research managers and offer them a career structure. If a research agency is to be effective, then there must be recognition that the organisation cannot be a cheap one—a lesson not yet universally accepted by the Civil Service.

I hope the foregoing will be of assistance to the Sub-Committee.
Dr Michael Ashley-Miller
April 1987

THE NUFFIELD PROVINCIAL HOSPITALS TRUST

The Nuffield Provincial Hospitals Trust was established as a charitable foundation by Viscount Nuffield in 1940 with the main purpose of promoting the improved organisation and efficient development of hospital, medical and associated health services throughout the provinces.*

Her Majesty Queen Elizabeth the Queen Mother is the Trust's Patron.

*The Provinces are deemed to be that part of the United Kingdom outside the Metropolitan Police District of London.

The Board of Trustees currently consists of eight members who between them contribute a wealth of knowledge and experience drawn from their varied activities in the academic, business and medical worlds. The Trustees meet formally three times a year to conduct their business, although individually the Trustees are frequently associated with the ongoing work of the Trust.

In keeping with the broad framework of the original Trust Deed, the general line of approach adopted by the Trust has been to act as an independent observer of the UK health scene and the National Health Service (NHS); and in particular of hospital and other medical services. It has attempted to illuminate current issues through informed debate, meetings and publications; and has also commissioned studies, demonstrations and experiments aimed at the improvement of services. Inevitably, reflecting the changing priorities and development of the National Health Service, the Trust has extended and evolved its own interests. Within the broad ambit of assisting developments in the National Health Service, at the present time the Trust is involved with furthering developments and opportunities stemming from the introduction of general management into the Service, and has a particular interest in the care of the physically disabled and the frail elderly.

The main activities of the Trust are the grant programme, symposia, publications and Fellowships:—

Grant Making

Because of the Trust's changing and evolving concerns, applicants for grants are requested to write to the Secretary initially, giving a brief outline of the study for which they seek funding. If it is thought that the proposed study would be appropriate and relevant to the current interest of the Trustees, applicants are then advised on the requirements for submitting a formal application to the Trustees. Decisions on the funding of applications for grants are taken by the Trustees at their regular meetings.

Symposia

The Trust has built up a successful programme over the years using the facilities at No. 4 Prince Albert Road. Symposia are intended to provide small expert discussions across the whole spectrum of the health scene; and many widely diverse topics have been included in the programme. Proposals for such meetings usually originate from the Trust itself but occasionally they are held on behalf of other bodies or individuals. They are invariably structured around specifically commissioned papers and invited participants.

The Trust has also from time to time set up specialist Working Groups which meet regularly to examine and debate a specific topic on which the members are expert. The results of Groups' deliberations are usually published by the Trust.

Publications

The Trust has been active as a publisher since 1941 and to date has published in excess of 160 titles.* Publications may arise from the Trust's programme of supported research in the form of reports, or at the request of other researchers who feel their research is of particular relevance to the purposes of the Trust. However, the majority of publications have arisen from Working Groups on completion of their deliberations; or from specially commissioned reviews of current key issues undertaken by experts in the particular field.

Fellowships

The Rock Carling Fellowship is awarded each year to a distinguished person to review in a monograph published by the Trust the state of current knowledge and activity and to speculate about the future of some subject which is relevant to the objectives of the Trust. The monograph is launched at a public lecture given by the author. *The Queen Elizabeth the Queen Mother Fellowship* was established on the occasion of Her Majesty Queen Elizabeth the Queen Mother's 80th birthday. It is awarded periodically to an expert to undertake to review in a monograph a subject within the sphere of the Trust which is believed to be of particular interest to the Patron.

On occasion the Trustees provide *Travelling Fellowships* to enable selected individuals from the UK to visit overseas to study aspects of health care systems in another country; and similarly grants have been awarded to overseas workers of distinction to visit the UK to examine a particular facet of the National Health Service. Again, the outcome of these Fellowships may lead to publication.*

Memorandum by the Association of Anaesthetists of Great Britain and Ireland

The Association of Anaesthetists of Great Britain and Ireland is actively involved in fostering and supporting research in anaesthesia in the United Kingdom. This is achieved in a number of ways. The

*A full list of Trust publications is available on request from 3 Prince Albert Road, London NW1 7SP.

*For those who are interested in the Trust's activities, a detailed account is given in the latest quinquennial report, which may be obtained from the Trust's offices at 3 Prince Albert Road, London NW1 7SP.

Association publish a major journal of anaesthesia, has pioneered endeavour in clinical audit, and supports research and a Research Fellow through the Education and Research Committee.

The journal, *Anaesthesia*, has a broad interest in clinical research. It has a large UK circulation and a smaller one overseas (total, 7,500).

The Association has introduced audit in the specialty from 1956 in the assessment of quality of clinical practice. It has in a recent study attained the co-operation of surgeons in this effort. It is about to launch a major pilot study into post-operative morbidity associated with anaesthesia. Lack of funds has severely limited the nature and extent of this activity. It is salutary to note that more patients will die of errors of anaesthesia than will die of AIDS in the next year.

The functions of the Education and Research Committee of the Association are to plan and organise research seminars and scientific meetings, and approve research grants. The Committee has approximately £30,000 per annum for funding of research projects, and £10,000 a year to sponsor seminars. Support recently has been for:

(a) A Research Fellowship. An individual, usually at the level Senior Registrar in Anaesthesia, is appointed on a full-time basis in an academic department to undertake research for a period of one to three years. This is usually a Clinical Fellowship.

(b) Purchase of equipment up to £5,000 for research workers in departments of anaesthesia.

(c) Support for travel grants to enable research workers to visit institutions in other parts of the world to study alternative methods and techniques.

It is clear to Council of the Association that inadequate funds are available nationally for research in fields related to anaesthesia, including intensive care and intractable pain. This conclusion is supported by the Association's finding that a large number of acceptable applications for equipment and Research Fellowships cannot be funded. The Association is presently the only body which earmarks funds for a research fellowship in anaesthesia, the MRC having discontinued such fellowships some time ago. Since funds at the disposal of the Association permit support of only one Research Fellow per year, there is extreme difficulty in clinical anaesthetists obtaining full-time research training and experience.

The current Association Research Fellow is a Senior Registrar at Addenbrookes Hospital, Cambridge, studying in an animal preparation the effect of induced hypotensive techniques (such as may be used in clinical practice) on brain oxygenation.

In response to the nine specific questions posed by the Sub-Committee, the Association responds as follows:

(a) *Priorities for medical research.* It is not clear how priorities for medical research are set. Indeed, it would most often seem that only basic research, and then in certain subjects, and political pressure, count. Research endeavours are predominantly a reflection of the interest of individual research workers, matched by their success in obtaining funding for their activities. In anaesthetic research, public health measures are more difficult to apply because of the small mortality, but large number of cases treated. It would be in the public interest to strengthen efforts in the important field of accident prevention. New anaesthetic techniques must also be compared with existing techniques. This type of research endeavour very rarely attracts research funds from Government agencies, and is largely dependent, and sometimes too dependent, upon the pharmaceutical industry. There is, too, limited funding for research into basic mechanics of anaesthesia, which could throw important light on mechanics of disease.

(b) *Balance between different branches of research.* Within the specialty of anaesthesia, funding by NHS, Government, Research Bodies (MRC) are so negligible that there is little to cut back.

(c) The Association is not aware of any particular problem in which *priorities change* during the evolution of altered health care, population, etc. It is important, however, to avoid over-enthusiastic change without reasonable evidence.

(d) In anaesthesia, too much reliance has to be placed on commercial funding for research. This is a reflection of the negligible success in attracting funding from other bodies. Unfortunately, however, that system of funding directs its own priorities and is often associated with lower quality research, and none into fundamental processes which are not judged commercial.

(e) The results of research are very well disseminated in the anaesthetic literature.

(f) *Unnecessary duplication of research effort* is avoided by peer review of research grant applications, thereby preventing funding of duplicated research.

(g) Usually, but sometimes there are delays, or good concepts get lost. The Association is attempting to repair this gap by encouraging seminars and examining a practical scheme for ensuring that new ideas are put into practice.

(h) Medical researchers require a longer and better exposure to basic science and more basic research training. Unfortunately, in the National Health Service, there is no provision for funding medical graduates to undertake full-time research training on comparable salary levels. A priority should be to expand the number of research fellowships linking basic science and clinical departments, and, of most importance, earmark specific minimal numbers for a specialty, such as anaesthesia.

(i) As above.

May 1987

Memorandum by the Association of Clinical Biochemists

INTRODUCTION

1. The Association of Clinical Biochemists (ACB) was established in 1953 to promote the advancement of clinical biochemistry in the United Kingdom. The members of the Association are medical and/or science graduates and are employed in the National Health Service, universities, research establishments and industry. The Association has strong ties with commerce and over thirty UK companies have Corporate Membership.

2. The Association promotes all scientific and professional aspects of clinical biochemistry and has standing committees for science, education, publications and professional affairs. The Scientific Committee is principally concerned with methods of clinical investigation, quality assurance, methodology and validation of scientific equipment and diagnostic products. The funding for these activities is gained from the Department of Health and Social Security and members own sources e.g. hospital endowments or commercial sources. The Education Committee is principally responsible for organising training and refresher courses and co-ordinating training requirements throughout the country. The main publications of the Association are a scientific journal and a current awareness periodical and both have world-wide circulation. A national meeting is organised annually which attracts international clinical chemists and has a large commercial exhibition.

3. The function of a Clinical Biochemistry service in an NHS District General Hospital is detailed in HM(70)50 and in summary describes the need for the provision of a consultant advisory service supported by adequate diagnostic facilities, covering all aspects of laboratory investigation including the interpretation of results and advice on further appropriate investigations. The initiation and direction of research and development with clinical staff, and teaching and training of junior staff and hospital personnel is a major function of all departments.

A How are priorities for medical research set? How do these reflect the particular needs of the NHS, or more generally the health needs of the nation?

A.1 The priorities for medical research in departments of clinical biochemistry are set largely according to individual interests, the facilities available and a need for prompt improvement of patient care. There are specific arrangements in Scotland whereby the Chief Scientist's Committee of the Scottish Home and Health Department and its Sub-Committees annually review priorities for medical research. The Universities are well represented on these committees.

The research activities of clinical biochemists fall into three categories:

A.1(a) Development of new diagnostic and monitoring procedures. The commercial supply of diagnostic reagents has been an area of growth in recent years and is a development which has met with approval by the Government. It is likely that this diagnostic explosion will continue.

This trend opens up great opportunities for collaboration between NHS scientists and industry. The need for improved or new methods is first felt in the user laboratory, and often leads to innovation—the basis of a better diagnostic product. Once developed any diagnostic reagent has to be thoroughly evaluated, both in terms of performance and clinical usefulness, and the clinical biochemist has a vital role to play in this area. Consequently, the clinical biochemist and industry form a perfect team, with the former doing the pioneering research and the final validation, and the latter doing the "scale up", production and marketing.

A.1(b) The evaluation and assessment of tests. There is a need to have a much better system for evaluating and introducing new tests, and perhaps even more important, for replacing old methods. It is not necessary to wait to be told by the epidemiologists that certain tests are not cost effective. Research is already taking place in departments in clinical biochemistry both into methods of diagnosing and managing patients which have enormous implications on the cost effectiveness of the service. The clinical biochemist has therefore a major input into the priorities of the service as he provides advice on the efficiency of developments and their cost effectiveness.

A.1(c) Fundamental research into disease mechanisms. Integration of basic scientific research with clinical research is difficult and needs an environment where both types of scientists can work side-by-side. Clinical biochemistry departments do not have an unique role, but they have an important part to play in relation to clinical departments.

B Is the present balance between different branches of research right? Assuming that resources are limited what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?

B.1 The balance between different branches of research is probably right providing that it is recognised that under the current financial constraint low priority, but nevertheless potentially valuable, research does not receive adequate funding. It is inherently difficult to predict the outcome of any line of research, especially in the long term, so that to suggest cutting out any particular line is imprudent. Clearly research which is likely to lead to the greater benefit for the greater number of people should have high priority in times of reduced resources. Therefore potentially preventable disease with high mortality or high morbidity, especially if it strikes the working population, requires maximum research input. It is doubtful that priorities would be affected by increased resources.

B.2 Preventative medicine—screening:

Advances in technology have led to a situation were it is now possible to produce simple, robust and cheap methods suitable for large-scale screening. No screening programme should be contemplated without considering the patient cost:benefit ratio, but there are many areas of health care where an early diagnosis will lead to effective treatment without long-term, expensive, hospitalisation. Examples of successful screening programmes already exist, but required to be offered to a wider public.

B.2(a) Newborn: screening for phenylketonuria and hypothyroidism is widespread but several other inherited diseases could usefully be investigated by screening procedures e.g. familial hypercholesterolaemia, cystic fibrosis and adreno-genital syndrome.

B.2(b) Adult, working population:

There would be great merit in screening appropriate sections of the adult population for hyperlipoproteinaemia, diabetes mellitus and with newer markers for breast and prostatic carcinoma. Workers from specific occupations could also benefit from screening for potential toxins and for evidence of liver and kidney disease.

B.2(c) Geriatrics:

Elderly patients could be screened for a number of treatable but debilitating diseases such as hypothyroidism, hyperparathyroidism, and renal failure.

B.3 Fundamental research into the disease process:

B.3(a) Coronary heart disease is a potentially preventable disease and was responsible for 28 per cent of the total mortality in 1985 and was a major cause of premature death especially for males. Despite present levels of funding there is an urgent need for fundamental research into the disease process and also for greater co-ordination in the clinical and laboratory based work.

B.3(b) The perinatal mortality has greatly improved in the last decade but the perinatal morbidity remains high. The cause of 65–70 per cent of congenital defects remains unknown and among live born infants 2 per cent have major abnormalities and a further 3 per cent have minor abnormalities. This area of research requires a high priority.

C. Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?

C.1 In general the answer is yes but the life expectancy of society is getting greater, and yet there has been virtually no research into the metabolic processes associated with ageing. The clinical biochemist is very well placed to perform long-term longitudinal studies that will give priceless information about subtle changes in metabolism with advancing age. Having observed these changes, their origin and their significance will become apparent. It will be possible to suggest prophylactic therapy that may delay or eliminate the changes, and so lead to an improved quality of life in later years and in a reduction in the financial burden to the NHS. Examples of conditions that may benefit from such study are osteoporosis and senile dementia.

D. How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect setting of priorities by the different institutions involved?

D.1 Priorities are influenced partly by policies developed by the funding body concerned and partly by emotion e.g. cancer and potentially fatal children's diseases. There is little co-ordination between the

different sources of funding and the assumption underlying the second part of the question may not be correct.

E. Are the results of research adequately disseminated?

E.1 The results of research are in general adequately disseminated. However, these results are not always adequately absorbed or acted upon by those in a position to act appropriately.

F. How is unnecessary duplication of research effort avoided?

F.1 Duplication of research effort can be avoided by better liaison between funding groups but it is not always desirable to suppress work when its importance is unknown. Certain research projects can only be successfully undertaken where there is access to adequate clinical material. In particular research into methods of biochemical detection and monitoring of disease often requires duplication of effort when the initial work is undertaken in pure research units without adequate access to clinical material.

G. Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?

G.1 Research should commonly be done where the results can be promptly applied. Often the research is done in departments or institutions where there is little relevance to application. Failure of research to improve patient care can also be due to the results of the research being unpalatable for various reasons, e.g. problems of smoking and alcoholism.

H. What changes in priorities in the training of medical researchers are needed?

H.1 The change required is not priorities in the training of medical researchers, but in the need to encourage young people to train adequately in research methods. The reduced MRC funding of intercalated research training for medical students is a retrograde step. There is a need to establish considerably more trainee posts and clinical research career posts. The current deterioration is a result of the reduction in the establishment of academic medical departments.

I. Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?

I.1 There requires to be a partial reversal of the reduction of basic support of academic departments in medicine. It may be necessary to close some departments in order that those remaining have adequate space, technical equipment and financial support.

The NHS should be more involved in the funding of research and should support quality scientists in career grade research posts.

April 1987

Letter from the Association of Clinical Professors and Heads of Departments of Paediatrics

As Chairman and Secretary of the Association of Clinical Professors and Heads of Departments of Paediatrics we are responding to your letter to Professor Clark, chairman of the Federation of Association of Clinical Professors, inviting comments on priorities in medical research.

We have sought the views of our fellow Professors of Paediatrics but of course the limited time scale has made it necessary for our response to be somewhat general in its content. However, the following comments are a distillate of those which have reached us:

(1) There is a feeling that research into conditions affecting children is under-funded. This is doubly unfortunate because of the distress to children who might have benefited but also because the subsequent costs of caring for preventable handicap are very substantial.

(2) Bearing in mind the need for a greater impact of research effort into the areas of prevention (and this encompasses education too) mentioned in (1) it is equally important to ensure that educational and preventative initiatives, however worthy they may seem to be in advance, are subject to rigorous evaluation in the event. Predicted effectiveness and actual value do not necessarily coincide.

(3) Greater effort needs to be made to stimulate innovative advances in service provision by the NHS—such as those in neonatal care in recent years. However, such innovations also need to be carefully evaluated so that in due course the advantages and disadvantages are clearly visible.

(4) Recent considerations of NHS professional structure, such as the report "Achieving a Balance" from the committee chaired by Mr Hayhoe, have notably omitted to consider the desirability of research as a training tool for clinicians—and the need for research as a way of developing medical care. Academic departments of Paediatrics have a major role in stimulating and supervising research and are finding it increasingly difficult to obtain either funds, or even sympathetic understanding of the problems. Research needs to figure much more prominently in the objectives of the NHS.

(5) Increasing difficulties in obtaining funding from bodies such as the MRC and the Wellcome must place greater reliance on monies collected by smaller, often problem-specific, charities. While such generosity is most gratefully acknowledged, funding can become lop-sided. Leukaemia and heart disease, for instance, are emotive subjects which attract public support easily, other topics can easily be starved of research funds. Other areas, such as mental handicap, may attract funds more easily for service provision than research into its prevention, which may seem rather esoteric to the public. Some attempt to redress the balance is probably needed.

(6) It is hard to predict what practical outcome may result from research. When the research is designed (as in (1), (2), and (3)) specifically to discover whether a change in care leads to a certain result, then it can be "customer" orientated. However, much basic research, and almost all really major advances, produce unforeseeable effects on patient care. It is very important that this basic research (not *directly* clinically relevant) be fostered too, and over-emphasis on the "customer-contractor" relationship would prevent this. Penicillin was not discovered because someone set out to find a treatment for infection; it was the fortuitous outcome of basic research directed to quite different ends.

Briefly therefore, the Association of Clinical Professors & Heads of Departments of Paediatrics would plead for:

(a) More child orientated research, not closely tied to specific charities.

(b) Research into innovative forms of delivery of medical care and their consequences; the prevention of illness and health education and their effectiveness.

(c) Special attention to the needs of basic, not necessarily clinically driven, research.

(d) Greater recognition of research work as a necessary part of a doctor's training and a legitimate call on NHS funding.

R J Robinson
President
I B Houston
Secretary

April 1987

Letter from the Association of Professors of Anaesthesia

The Association of Professors of Anaesthesia is a group which meets three times a year comprising the 20 Professors of Anaesthesia in Great Britain and Ireland. Collectively, the Association funds no research nor exercises any controlling interest or sets any priorities. However, each member individually undertakes research and several members are associated, one way or another, with grant-giving bodies or the assessment of research grant applications. The Association of Professors, thus, feels able to speak with confidence on the situation as it pertains to the specialty of anaesthesia. However, there is a significant omission in that the MRC funded unit at the Clinical Research Centre, Northwick Park, is not represented because the Head of Department (Dr. J. F. Nunn) is not a Professor. We applaud the Select Committee's attempt to determine priorities in medical research.

SPECIFIC QUESTIONS

(a) Our members are largely concerned with clinical research, or fundamental research for which there is a fairly obvious anticipated clinical "pay off". It thus follows that generally the research is rooted in a perceived potential clinical need. Priorities are set initially by researchers' preference, their previous involvement in the field and the availability of appropriate facilities and clinical material. The support they receive from grant-giving bodies is frequently conditioned by their "track record" in this particular field. This is particularly so in the case of the large grant-giving bodies who will be heavily influenced by previous successful research, of a similar or related kind. In practice, we have to set our own priorities for medical research within the limitation of funding; obviously, some programmes of research are easier to fund than others and in the present climate research which attracts funds is considered to be of high priority.

(b) When considering the relative priorities placed upon research in anaesthesia and intensive care, *vis-à-vis* other medical specialties, it is difficult to eliminate the pressures of special pleading and self-interest. Nor is it necessarily a practicable exercise to try and weigh-up the potential benefits of different pieces of research in totally unrelated fields. However, apart from the MRC Unit we are not aware of any Department of Anaesthetics which has an MRC project grant at present and only one with an MRC Student's Scholarship. Likewise, we are unable to identify any Professor of Anaesthetics who has had support in the recent past from the Wellcome Trust. No one has support from the SRC. We feel there is presumptive evidence, therefore, that anaesthesia is not currently regarded as a topic which warrants high level support. The reasons for this may be that it is thought that more good could be generated by the careful application of what is already known than from any further fundamental discoveries of the mechanism or effects of anaesthesia. However, this bias is extreme and unjustified. We are unable to comment on the other questions contained in paragraph (b).

(c) For the reasons given in para. (a) above, at least as far as anaesthetic research goes, it is certainly adapting to changes in incidence of disease and as a response to new technology, although the influence of changes in population structure would be difficult to detect.

(d) There is no doubt that different institutions have separate priorities. The Wellcome Trust, for instance, only supports grants which they describe as "hypothesis led", and not "procedures led". This inevitably colours the support they give. The Medical Research Council from time to time indicates areas where it is anxious to provide support—anaesthesia has never been one of them. The National Health Service through Regional Research committees propagates small research grants for what appear to be clinically important areas: Pharmaceutical Companies inevitably promote research that is necessary for them to meet the requirements of Regulatory Authorities and to sell the product (e.g. Committee on Safety of Medicines). Medical Equipment Companies, by and large, do not fund research. As far as anaesthesia is concerned, there is a strong predominance of research associated with the introduction or possible introduction of new drugs and the specialty is, therefore, very heavily reliant at the moment on commercial funding.

(e) In anaesthesia, the results of research are very adequately disseminated. The Anaesthetic Research Society meets three times a year and has a high attendance: there are two UK anaesthetic journals which are widely read and a European Journal in the English language which reaches senior academics throughout Europe. In addition, most areas of the country have Regional Societies for the further dissemination of research.

(f) Unnecessary duplication is largely avoided by a high level of knowledge within the relevant community concerning what each University department is doing. It thus relies on formal and semi-formal contacts. No doubt proposals for major funding in similar areas are generally to the same bodies, and thus, a measure of selectivity is produced.

(g) We believe good evidence could be adduced to show that research in anaesthesia has resulted in improvements in patient care. Where it does not do so may be because anaesthetists are, by and large, cautious in outlook, accustomed to coping with unexpected problems and therefore naturally wary of introducing new variables into proven techniques. There is a further effect at present due to financial constraints associated with the introduction of general management into the NHS, such that some obvious advances are not being introduced, because they involve additional cost. Some leading departments are finding that new drugs which are more expensive may not be made available by the Health Authority.

(h) Over the last few years there has been a reduction in the number and quality of posts to train medical researchers; in anaesthesia this is evident in the reduced number of MRC grants to students, and the difficulties in funding clinical lecturer posts in equivalent NHS training grades of Registrar and Senior Registrar status. Serious academically orientated young doctors who intend to take a career in research can usually obtain appropriate training by writing a PhD or MSc thesis in a basic science related to anaesthesia. One disincentive to do so is the fear of losing their place on the promotion ladder and also of interfering with their studies for professional higher diplomas. There is undoubtedly potential for new methods of research training for young doctors who are less committed to an academic career. It would be valuable if they could undertake research training not particulary related to the obtaining of a research degree in a University. We know of no specific courses of, say, one year's duration (which would be probably all that would be needed) for inculcating a sound knowledge of research methods. We believe that this is a field in which the MRC might experiment. Currently, some doctors obtain something comparable by being funded for a year to undertake a project of interest to a Pharmaceutical Company and may also use that time to obtain a broad academic education.

In general, the bias to obtaining training by a thesis attachment to a basic science department makes it less likely that emergent researchers will fully appreciate the particular problem of clinical and applied research. This probably *does* represent a misapplication of priorities which ought to be corrected.

(i) Competition for research funding is an important part of academic practice, but in recent years academic anaesthetists have spent hundreds of hours of precious time in fruitlessly pursuing major grants from bodies such as the MRC. Indeed, many now feel that this is a waste of time.

Professor A P Adams
Chairman, Association of Professors of Anaesthesia

April 1987

Memorandum by the Association of Professors of Dentistry

This Association represents a wide range of interests which cover the whole range of dental research activity from basic biological and materials research at the one end to patient orientated investigations at the applied end.

(a) In so far as generalisations can be made, each institution's priorities are based on its own current strengths. Although not all research has direct and immediate application to the clinical problems of the day, much of the fundamental research in dental schools is aimed at clarifying the basic processes which determine oral health and disease, with the long term objective of developing more effective preventive and treatment methods. However, all of the research workers are aware of problems in health care and direct their efforts to meet these in the long term.

(b) Current resource allocations to dental research are extremely limited to the extent that many good researchers and centres are starved of funding. Cut-back in funding for both basic and clinical research, together with cut-backs in University funding, is productive of problems relating to equipment and also to retaining good research staff. Most areas of research require a team of people working in unison with the appropriate equipment and consumable funding. Where resources are limited it might be considered desirable to concentrate these where known areas of expertise exist within the country. There is already compelling evidence of the effectiveness of relatively simple and inexpensive preventive measures in the changing pattern of dental caries in developed countries. The pursuit of effective measures to prevent other oral disease or to make more efficient the deployment of the resources for the provision of treatment could be a very cost effective way in which to distribute research funding.

(c) Dental research workers are able to adapt rapidly to changing disease and population parameters and also to take full advantage of technological advances, and the changing pattern of dental disease and recent National Reports (Nuffield 1981 and Strategy Review Group) are stimulating profound changes in the direction of research activity.

(d) Research Councils award dental research grants based on the scientific merit of the application. However, some areas of research are unpopular with the Research Councils, Charities and Industry. While more and more researchers are turning towards Industry, this is a source from which the extraction of research monies is difficult since the commercial rewards resulting from products of dental research are limited in comparison with the markets for the products of medical research. Furthermore, the "applied" nature of work funded by Industry is conducted at the expense of fundamental research and this will have far reaching implications in the future. The repeated writing of research applications is of itself very time-consuming, and when rewarded by only partial funding or scientific approval, but no funding, is demoralising and eventually will lead to an absence of suitable applicants for research posts.

(e) Research publications are slow to achieve publication and their dissemination is further hampered by the decreasing subscription rate to international journals because of the high costs involved. International conferences are showing decreased attendances because of a lack of available funds for workers to attend such conferences.

(f) This can be reduced by good communication between funding agencies. Wide dissemination of research activities between comparable institutions, including the capacity to attend meetings between workers in the same fields, is essential.

(g) Aspects of research do result in improvements in patient care, but the lag time can be very long. This is partly because of the difficulties often experienced in convincing practising clinicians that they should change, and also points of a lack of communication between researchers and clinicians. Many clinicians consider that incentives should be provided to attend meetings which provide opportunities for such communication.

(h) More funding is required to train dental research workers. Much of the post-graduate training in dentistry relates to clinical training, and while this satisfies the needs for clinicians, it ignores the longer term research needs. There are difficulties in attracting suitably qualified clinical research workers, partly because of the relatively poor salary scales for research workers in comparison with clinical scales,

partly because of the uncertainty of continuity of employment in research posts, and partly because the rigidity of higher clinical teaching pathway requirements discourage the clinician who wishes to embark seriously on research after acquiring Fellowship of one of the Royal Colleges.

The establishment of proper training and career pathways in dental research and the allocation of proper credit for time spent in research in higher training pathways could form a worthwhile priority to facilitate the training of dental researchers.

(i) Considerations should be given to designating dentistry as a priority area, especially in respect of the recruitment and subsequent retention in the dental field of suitably qualified, top grade people. Sufficient funds should be made available to permit the funding of those research products which are rated highly by granting authorities.

I trust that you may find these comments helpful.

Memorandum by the Association of Researchers in Medicine and Science Ltd

1. Statement of proposals for improvement in the practice of medical research

The Association is grateful for the invitation to provide evidence to the Sub-Committee on medical research. We hope the Committee will agree that our evidence should form the basis for discussion followed by some urgent action on the implementation of specific proposals.

We would fully confirm the views expressed in the Croham report on the UGC concerning the lack of co-ordination between the DHSS and the DES on the support of medical education. This naturally also affects the support for and practice of medical research and particular problems and priorities are dealt with in this document under the headings of the nine specific questions put by the Sub-Committee. As outlined below we are closely involved in carrying out medical research and very concerned about the problems we have identified. We welcome the appointment of a Sub-Committee under Lord Nelson of Stafford to investigate the matter.

Background

This Association was set up in 1978 by researchers working in the medical research field because of increasing awareness that the lack of any career prospects and poor employment conditions were leading to a fall-off in recruitment, as well as a loss of able science graduates. This, we predicted, would inevitably affect the quality and quantity of research in the UK. Since then, data about the way research is funded and the principal difficulties resulting from the lack of any long-term strategy, or a coherent UK science policy, have been highlighted. Our activities have included a petition in 1979 to the Department of Education and Science (DES) and a lobby of Parliament. This led to discussions with the Under Secretary of State for Science, the Secretary of the MRC and representatives of the Committee of Vice Chancellors and Principals (CVCP). In 1980 we published an analysis called the "Case for Careers in Medical Research" followed in 1981 by "Detailed Career Proposals". In 1983 we hosted a symposium on "Academic Research in the UK: its Organisation and Effectiveness," where all concerned with research and its funding were invited participants. Poor recruitment into research has been quantified and publicised in two recent surveys of posts for post-doctoral research workers. These led to a further all-party supported delegation to the DES in April 1987. The DES, Research Councils, Universities and CVCP, have been approached individually, but each remains firm in the belief that the responsibility lies with one of the other departments/organisations.

The Association's main concern is the need for more professionalism in research. This predicates adequate training, and a sensible balance between experience and fresh talent deployed in medical and scientific research in the UK.

The Association's aims are to:

(1) Establish a satisfactory career structure for researchers in medicine and science.

(2) Improve the quality and effectiveness of research.

(3) Improve the interests of *all* those engaged in research.

(4) Promote public awareness of research and the role of the researcher in society.

The Problem

There is now a very serious crisis in recruitment of research scientists in the UK resulting from the absence of a rational, fully integrated career progression for researchers. This crisis first emerged in medical research, the field from which most of the Association's members were drawn in the past, but is now a problem in all disciplines. While traditionally it has always been claimed that the most cost effective way of conducting research in Medical Schools, Universities, Polytechnics, Colleges and Research Institutes is to support only young individuals on short-term grants, this inevitably involves a wastefully high turnover

of poorly-trained researchers who have had very limited opportunity to establish their credentials and who foresee little opportunity to do so. Moreover, the system is outdated; it has failed to keep pace with major advances in the field and thus recognise the need for a cadre of mature experienced practising scientists, able not only to exploit their own talents, but to initiate and guide new entrants to the field. From recent surveys, and the experience in other professions such as nursing, it is now clear that sensibly provident young people, let alone the intellectually highly gifted, will not be interested in such an unattractive prospect, or be prepared to commit their lives to such an uncertain future; especially when there are now so many opportunities in the City and elsewhere. The future of fundamental science in the UK is seriously affected.

The Solution

Provision of a progressive career structure in medical and scientific research to which researchers of all disciplines may aspire. This structure must encourage *recruitment, retention and motivation* of researchers with the appropriate qualities as well as qualifications, while allowing flexibility in deployment. Achievement of these objectives will not only restore the morale of those at present engaged in research, but will also lead to the recruitment of a highly motivated cadre of researchers and thus improve the efficiency and effectiveness with which research is prosecuted. Achievement of these objectives is essential to stem the brain drain not only from the UK, but from science and engineering within the UK. Implementation of the above recommendations will also be a major determining factor in the economic success of this country in the next decade and beyond and will be equally vital for its future health.

2. Evidence relating to the nine specific questions asked by the Science and Technology Committee

(a) The question of whether priorities reflect the needs of the NHS is an important one. Unfortunately, priorities generally relate to the study of particular diseases in the light of current fashions. Too much emphasis is placed in "band-waggon" research with support only for the present "elite" which means less popular research areas may suffer. Support for good research should be available across the board, with more emphasis on collaborative studies between clinical and basic science departments on health-related research. The setting of priorities, as has recently occurred with AIDS research, would seem to be a rare event. There must be recognition that successful medical research today involves a multidisciplinary approach and that transfer of fundamental insights or technical advances into patient care requires continuity and single-mindedness applied over many years. This is more likely to be achieved by the provision of careers open to both basic scientists and clinical scientists, with particular emphasis being placed on the need for careers for basic scientists working in clinical departments; interdisciplinary effort requires appropriate incentives for all involved.

An increasing function of Regional Health Authorities should thus be to fund research posts in Medical Schools and Teaching Hospitals. These posts and this research should be adequately monitored. There is evidence that out of London the NHS is prepared to support multi-disciplinary teams and to give permanent posts to research scientists on similar conditions to those applying to Hospital biochemists and physicists. This needs to be explored and encouraged. One mode might be that pursued in the North Western RHA, with necessary expansion. This would in part allow the NHS to have more direct influence on research areas.

(b) It is not clear what the Committee might regard as the "different branches of research", but the question of balance and priorities cannot be divorced from (a). The question of balance between various "-ologies" or between various health problems is not within the competence of this Association: the question of how changes in priority can be accommodated and best exploited is. It is clear to us that an employment system which retains competence and experience and allows adequate flexibility of deployment of that talent within the framework of employment continuity must allow a more powerful response to changing priorities and emergent problems than the present system of allocating many untrained and inexperienced workers to problems for very short periods. Although the NHS priorities must lie with direct study of health problems—and the delivery of solutions to health problems to the general public—it must be remembered that many major advances in health care have stemmed from curiosity-driven basic research with no obvious connection to medicine. Thus provision must be made to support at some practical level good work done in currently unfashionable research areas. This also means a change of accent from support of short-term, fashionable and often trivial research, as at present, to a longer-term view with appropriate personnel support structures. There needs to be more funding for high quality basic research so that the necessary skilled personnel capable of covering a wide area of knowledge are available to be applied to specific problems. Care needs to be taken to integrate basic and applied areas.

Increased resources would thus help for the above reasons. The commitment should be to excellence rather than current fashion, and to providing the secure climate in which innovative ideas can flourish and be critically evaluated.

(c) Priorities are not changing in the right kind of way. While the MRC is concerned with fundamental research and is mindful of the application of such research to the diagnosis of disease and treatment of patients, there are areas of research which are virtually excluded. There is a lack of foresight. Frequently too little is done and too late, particularly relating to the exploitation of new technology. These have in the main been due to the enterprise of industrial companies e.g. CAT scanner and NMR, but there are

other areas such as fibre optics. No one organisation seems to be particularly interested in such activities and so the techniques are left undeveloped here and pass to the USA and Japan. We would consider the NHS should be more active in supporting such work.

One weakness in exploiting new technology for the benefit of the patient and the NHS, lies in the short-term funding. This means that a trained research force is not available to produce, let alone interpret, results and thus make the best use of new technology. There is no training because most medical consultants do not have the time, or appropriate expertise. Lack of career progression for basic scientists and the accent on the young inexperienced graduate employed on a short-term basis, can mean expensive and sophisticated equipment is inadequately maintained, or runs inefficiently and this in turn leads to results of questionable validity which retard rather than advance knowledge. In order for the system to work to the best possible advantage there must be a suitable infrastructure, or much of the funding will be wasted.

(d) Institutions (Hospitals, Medical Schools, Universities, Medical Research Council) exert strong influences. This frequently involves a total change of direction when a Director or departmental head, retires, moves, dies, or adapts to current fashion. Extremely good Units are frequently disbanded and capable scientists forced to give up their research altogether simply because of political forces and the absence of any on-going commitment to them. There is an overvaluation of directors. If a Unit's overall research is excellent it should be assumed that the remaining scientists will continue to produce good research until they show otherwise. It does not make sense in the long-term to close good units. The hierarchical structure inhibits collective effort and initiative from subordinate staff. There would seem to be some value in establishing co-ordination between funding bodies to ensure that there are some bodies available to support unusual or unfashionable areas or ideas.

A major element in the commercial funding of research is the prospect of commensurate return. This means that many serious medical problems affecting relatively small groups will be relatively underfunded, compared to comparatively trivial medical problems of a chronic nature, or those affecting a large number of people. (Compare expenditure of drug companies on minor pain killers and expenditure on cancer research.) Whilst it is important that discoveries made outside industry should be exploited, the absence of any satisfactory career for researchers outside industry means that any effective, and indeed necessary, interchange of research staff is almost non-existent.

(e) Dissemination of research findings is frequently inadequate. We also hear much criticism from clinical colleagues that development work in the application of established techniques is not properly supported by the MRC or the NHS. The knock-on effect of the "band-wagon" approach means reviewers and journals and grant-giving bodies are heavily orientated in fashionable directions. The accent on short-term support inevitably adversely affects the prospects for original research, and the original researcher, because it is considered such a gamble. Thus only "safe" research is likely to be funded. Innovative ideas are traditionally greeted with some scepticism and often frank antagonism, not because they challenge accepted wisdom and practices, but because they are seen to challenge vested interests and estsablished hierarchies. This attitude is less prevalent elsewhere in the world and is the major reason why so many original British discoveries come to commercial fruition in the hands of others. Consequently, many such ideas have been exploited by competitors in the USA or Japan.

(f) Duplication of good research is not necessarily wasteful; rather the nature of scientific knowledge dictates that independent confirmation of results is essential—particularly to give credibility to innovative ideas and ensure their widespread dissemination. Nevertheless, the traditional accent on short-term funding coupled with the "band-wagon" approach is a major problem. Much unnecessary duplication, or frankly bad, irreproducible research stems from a combination of lack of training through absence of trained staff, inadequate time for supervision by the busy medical consultant, no knowledge of the literature by the young graduate, or time—because of the pressures to produce results and publications created by the short-term grant—to check the literature, or the proposed methods. This can lead to the "rediscovery of the wheel" every decade, or much time wasting by subsequent workers trying to separate fact from artefact. Unnecessary duplication, or such irreproducible research, can only be prevented by ensuring that a core of trained staff of appropriate levels of seniority is available to provide adequate background knowledge and supervision, as well as training.

(g) Research is not reflected as much as it should be by improvements in patient care or health education for several reasons. The first reason is the existing system of short-term contract research with its continued insecurity. This breeds a lack of commitment or motivation. Progress is restricted because researchers leave for secure jobs part way through a grant. This presents problems, particularly to Industry when contracting-out research because agreed time-scales cannot be met. There is a constant and rapid turnover of staff which results in considerable waste of effort and time in repetitive retraining. Another problem is the lack of appropriate mechanisms for recognition of such advances as are possible. More importantly, funds to take advances from the then critical phase of development to widespread application are generally lacking. One of the areas of concern here is the current intense research activity in the field of molecular genetics with its relatively costly techniques. These will require considerable financial input to take them through to the appropriate application stage within the NHS at some future date.

(h) This question asks what changes are necessary in something we were not aware existed. If priorities in training medical researchers are made, who makes them and what are they? Researchers in medical science come essentially from two sources. Those who have graduated in medicine and those who have graduated in one of the many branches of science. The research training of medical graduates is generally acquired by virtue of their having to obtain a medical doctorate in order to progress in their career and does not necessarily indicate a personal interest in, or facility for research. Those with a greater interest in research may study for their MD full-time and may, more rarely, study for a PhD. The majority obtain their MD part-time and the research may well be performed more as an educational requirement than for its intrinsic value to science or medicine. Non-medically qualified science graduates entering medical research usually followed their first degree by study for a PhD. In the past the MRC has supported both of the above as follows.

(a) Intercalating medical students. This involved students spending a year following their preclinical training studying a subject in depth with a view to obtaining a BSc, and thus encourage possibly 25 per cent of the best of them to return to medical research after obtaining their degree.

(b) PhD studentships for postgraduates. The MRC has now indicated that it plans to end support for (a) and has already severely cut back on (b). The remuneration for the latter was also abysmally low. This has meant that the non-medically qualified have often obtained their PhD part-time while working on a short-term grant. While this normally elicits greater commitment to a research project there is often no requirement for the supervisor or institution to provide adequate "training", or any general assessment of whether there are suitable facilities for training, or even adequate supervision.

It will be evident from the very existence of this Association and the evidence already presented in this document that radical changes are needed to provide adequate training in medical research, both for the medical and science graduate. As outlined above no specific training is given, nor is it possible, for the reasons discussed. Training is essential and can only be provided by senior staff skilled in the practice of research and involved in it full-time, with an adequate knowledge of the appropriate technology, the background literature and the problems and pitfalls responsible for much of the non-reproducible research. The criteria as to the number of PhD studentships should not be based on purely financial considerations but a proper assessment of the number of post-graduates required. The intercalation of medical students has been an excellent feature of medical education and some organisation should be supporting it.

(i) This question is really the nub of the matter. Specific changes are essential in both organisation and funding, not only to increase the quality and quantity of medical research, but also to provide essential training; more importantly to make the most of the limited time available to the young medical doctor wishing to gain post-graduate research experience. One of the most frequent criticisms made by such young doctors is how much more effectively their time could have been spent if they had not had to waste so much time assembling equipment, getting methods to work and so on.

The best path to speedy success is to ensure that taxpayers' money is spent more efficiently and effectively on careers for researchers of proven worth. This will require recognition that research must be a full-time continuing commitment for those demonstrating the required qualities as well as qualifications, after an appropriate period of training and probation. Such careers, providing the necessary security—but no more than that currently provided by industry—could be established without sacrificing flexibility. The future of medical research in the UK thus involves a straight choice between spending the major part of the money currently available on short-term contracts—renewable only up to a specific age-barrier in the early thirties—as at present, which has led not only to inefficient and ineffective research, but also to a fall in morale and poor recruitment. The alternative necessary to *reverse the above situation*, is to use a proportion of the not inconsiderable amount of money currently spent on medical research to establish a progressive career structure, which will maintain continuity and provide appropriate training. The latter will inevitably improve the quality and effectiveness of research in the UK.

This Association views the present situation in medical research with great concern. It has recently provided figures that show a failure of recruitment of able scientists from all disciplines into research at both the graduate and post doctoral level. The Association predicted this crisis in 1979 and has been trying to alert government to it since that time. The main reason, again highlighted in these surveys, is an increasing awareness of the unattractiveness of medical research because of poor employment conditions (which frequently also involve waiving statutory rights), the insecurity and lack of future prospects. Hence, the preference among graduates for jobs offering long-term prospects outside research altogether—such as accountancy, or the City and also the disenchantment of A-level pupils and undergraduates with science or engineering as an option. These effects are more damaging to medical research and science generally than the brain drain overseas, since emigrants at least remain in the field keeping up with advances both in the literature and technology. They could eventually return following improvement in employment prospects within the UK.

Recommendations to the Select Committee

It must be recognised by all parties that:

(1) Medical research is as vital to the future health of the nation as are teaching and medical practice.

(2) The present system is *inefficient* in the use of human and financial/capital resources.

(3) Research is now a multidisciplinary effort.

(4) Good research requires the recruitment and training of dedicated and able researchers.

(5) A transient, young and inexperienced, migrant work-force no longer fulfils these requirements.

(6) To reverse the current alarming trends and ensure adequate recruitment, researchers should be treated fairly and given

(i) training within the framework of a progressive career structure which offers long-term prospects for the most able, in terms not only of talent, but also of commitment, effort, achievement and responsibility;

(ii) appropriate status, equivalent to that of their academic and clinical colleagues.

April 1987

Letter from AXrEM, EMTA and GAMBICA

Thank you for your letter of 5 March to which I am responding on GAMBICA paper although the response covers the three Associations—AXrEM, EMTA and GAMBICA, i.e. diagnostic imaging, patient monitoring and laboratory equipment.

In addition to being in the high technology area of medical equipment this sector includes a number of multinational companies. Nevertheless a number of those are, in fact, net exporters from their UK operations.

I am aware of the response that has been sent to you by Mr. Peter Styles (BHTIC) and believe that that gives a good general reflection of industry's views.

Two particular comments related to the AXrEM/EMTA/GAMBICA sector will, I trust, be useful additions to those overall comments:

(a) As we pointed out at a meeting this sector had with Baroness Trumpington on 4 December 1986, the international nature of the medical equipment business means that many companies can rarely afford to produce to a specified national need. They usually take into account the requirements of other nations and produce a (market weighted) common requirement suitable for as many as possible.

(b) From the diagnostic imaging sector, which really is multinational, particularly with the latest merger announcement, a representative comment is reproduced verbatim as follows:—

"Manufacturers of diagnostic imaging equipment for the NHS wish to more fully assist the NHS in determining and introducing means of disease detection and treatment by innovative technology which assists in improving the health of the Nation. The financing of R & D activities is usually dependent on suppliers' own R & D budgets or those of independent trusts or charities. Manufacturers would welcome increased opportunities to participate in formal research funded in the NHS and geared to specific aims in the NHS. The development and provision of improved facilities, for example in diagnostic imaging and treatment, may often achieve a reduction in overall costs when surgical and bed costs are reduced.

We believe that medical research should be seen as a special case. The present tendency towards the purchase of cheapest commodities for traditional requirements in the NHS may lead suppliers to conclude that UK R & D is difficult to support by industry."

I trust this will be helpful to your Sub-Committee.

J W Christopher

April 1987

Letter from the Back Pain Association

Thank you for your letter of 3 March with information of your Sub-Committee's task of considering priorities in medical research, with particular reference to the needs of the NHS.

With back pain being second only to respiratory problems as the major cause of absenteeism from work (for example 33.3 million days were lost in 1982–83) the Back Pain Association gives much emphasis to its principal objective of funding research into the causes and treatment of the problem. In this the Association receives no assistance from the Medical Research Council and relies completely on voluntary donations to support its work. Evidence of the research work being funded by the Association is given on the attached descriptive list of the projects which are underway at present, and it is hoped that this information might be of interest to the Sub-Committee.

Group Captain C A E Simons
Executive Director

March 1987

BACK PAIN ASSOCIATION

Current Research Grants

Grant Holders	*Centre*	*Project*	*Grant*	*Remaining Commitment*
Dr S Roberts	Charles Salt Research Centre, Oswestry	Study of the tissue and structural properties of intervertebral discs to determine the changes which occur as part of the normal ageing process and their effects.	£28,425	£12,473
Professor C Aitken	University of Edinburgh	Study of the relationship between the attitude toward their own disability of patients suffering from low back pain and the response of those patients to treatment. The results obtained should help patients make better use of the treatment and advice available to them.	£9,057	£2,772
Dr J Foster	University of Strathclyde	Study of the mechanisms of lumbar intervertebral disc deformation in order to provide a more rational basis for effective surgical management of spinal disorders and to add to the information into the causes and prevention of disc-related problems.	£3,300	£3,300
Dr T W Meade	Northwick Park Hospital	Multi-centre randomized controlled comparison trial of chiropractic treatment and hospital out-patient treatment of low back pain to analyse if one method is more beneficial than the other.	£39,290	£39,290
Mr R Smith	University of Bradford	Evaluation of the psychological factors in the causes and treatment of chronic back pain. The study should provide practitioners in the field of chronic back pain with psychological assessment information for use in patient management and guidelines for referrals to clinical psychologists.	£27,585	£25,415
Mr R C Mulholland	Harlow Wood Orthopaedic Hospital	Comparison of magnetic resonance imaging (MRI) and radioculography in the treatment of patients with lumbar disc prolapse. The study should provide fundamental information on MRI in the evaluation of back pain.	£39,925	£39,925

Memorandum by Professor Denis Bellamy, University College, Cardiff

1. Although the impetus to study ageing arises largely to cope with the practical and clinical problems of human ageing, gerontology has a much wider scope than geriatric medicine. This area of experimental

investigation has lines of study extending deeply into biology. The past life-history of the species as well as its present lifespan must be investigated. It is in this very broad sense that gerontology is a unified body of knowledge with clear guide lines of principle which have been hardly explored. This unification of the subject has recently become clearer in the biological sphere and there is now a firm belief amongst biologists that we are close to a unitary evolutionary principle at the chemical level which explains ageing and offers testable predictions. From this point of view research on ageing will throw light on a wide variety of different expressions of this principle which are described clinically as degenerative diseases.

2. We do need to study the principles of ageing in depth for sound social reasons. The beneficiary of any results arising from experimental gerontology is the branch of medicine termed Geriatrics. This deals with the clinical, remedial, preventative and social aspects of old age. It is essentially hospital-based and in the main deals with the practical problems of managing individual elderly people who are ill.

Research by specialists in geriatrics has increased with the development of geriatric hospital services, but staffing and finance is still inadequate to provide a healthy and independent old age for each elderly individual. About eight million people, about one in eight of the population of the United Kingdom are aged 65 and over. Most of them are totally independent, mentally alert, but dependency increases sharply.

It is the cohorts over 75 (between two and three million, increasing to 3.5 million by 2001), who demand the greatest share of medical care. In particular, coping with the health problems of the over 85s will be the major health challenge for the next thirty years.

3. Medical and social problems of coping with an increased proportion of elderly in the population are not confined to the developed world. The health benefits of arising from western medical technology are now producing the same problems in those developing countries that have adopted measures to combat premature deaths from environmental diseases. In Latin America for example the over 80s cohort will increase about two fold by the end of the century. Most of the world's population is beginning to encounter medical and social problems of caring for the elderly when they have not yet overcome the problems arising from the population explosion in the younger age groups.

4. Medicine has tended to concentrate upon the problems of children and people of working age and the pattern of development of medical services has not encouraged the interdisciplinary pattern of research essential for investigating the elderly. Classically, medical research has been associated with the identification of groups of individuals with specific diseases followed by the identification of the factors common to that group. The assumption is that for each disease there is a specific exogenous, and/or, intrinsic cause for each dysfunction. In this way for example, bacteria, viruses and toxins may be suspected and then confirmed by specific tests. In addition, groups of individuals presenting with the same symptoms can be treated in different ways and the results from each group compared as a test for a multiple origin of the symptoms. If, as seems likely, the factors determining the rate of ageing are different from those causing age related diseases and disabilities, this approach will not work with diseases of ageing.

Most of medicine is confined to the identification of the sick who are referred to a specialist. The development of these specialist medical services, for example, in respiratory medicine, cardiology, neurology, gastroenterology and genito-urinary medicine, which concentrate on problems of the middle-aged ill, has led not only to a narrow physiological approach but also the exclusion of both the very old and children from the group of people studied. The medical profession is not built upon the biological, developmental, perspective of the human life cycle. Its specialist services are sharply divided between the three divisions of the young, middle-aged and the very old. Concentration solely upon the young or the middle-aged inevitably means that possibilities of the early genesis of terminal problems are either likely to go unnoticed or, if noticed, they may be considered irrelevant to the life a patient several decades into the future.

5. From an academic viewpoint, ageing is the inevitable outcome of life being organised as an interlocking system of unstable chemicals and sequential biochemical reactions that tend to drift towards disorder. Therefore, life is a biochemical strategy to overcome chemical deterioration. This viewpoint should place the study of chemical deterioration at the centre of biochemistry and molecular biology but until recently, gerontology has made little impact on biochemical thought. This is due partly to the separate historical development of each subject area, but also because ageing is seated in the work of genes, which are only now beginning to reveal their secrets. Since clock-like mechanisms, synchronised with lifespan, are involved in the manifestation of many biomedical phenomena, such as the failure of reproduction and the initiation of cancerous growth, gerontological investigations are clearly of general academic relevance to many fields of biology, as well as having important socio-medical implications.

6. From an academic point of view, experimental gerontology is much more than the study of terminal processes. Increasingly, life is viewed as a continuum where past physico-chemical events and the impact of previous environments influence future behaviour. In this respect, gerontology provides a much needed forum where extreme specialist views may be moderated and, as such, the subject will play an important socio-scientific role in the future development of biology and medicine.

7. Research into the reasons for the decline in our capacity for adaptation lags far behind studies on the basic mechanisms of growth, maturation and tissue maintenance. Also, research into the biology of ageing has not kept pace with the spectacular successes of clinical medicine, so there is now a great discrepancy between the amount of money and knowledge available to keep young people alive and that devoted to maintaining the aged in good physical and mental condition.

The present relatively low level of support for research on ageing is partly connected with the way in which gerontology has developed from what was the low status medical field of geriatrics. It was only in the 1950s that attention began to be focused upon the problems of the old people who had been considered unfit for rehabilitation and who had been deposited in the workhouses and empty sanatoria. Doctors in these units started the development of geriatrics as a separate medical specialty by demonstrating that rehabilitation could be successful in the elderly.

Within biology ageing is still largely separated from mainstream thought. As an isolated body of knowledge it has been omitted from most biological and medical curricula, leaving a large gap in the training of those young people needed to develop gerontological research. To these historical impediments may be added a current bias against research proposals, arising from ignorance on the part of those in competing fields; the high cost of maintaining stocks of vertebrate animals of known pedigree into old age; and the difficulties that many specialists encounter in moving into what is essentially a complex interdisciplinary area of research, where it is difficult to relate findings at a chemical level to problems at the level of organs and whole bodies.

There is also a largely unassessed factor arising from the fears of many scientists, who could potentially contribute to gerontology, that the study of ageing might provide a way of prolonging life and so add to our present unsolved social problems. In this regard there has been a swing away from the stated aims of the early gerontologists who were concerned with the possibilities of extending life indefinitely to the more circumspect aims of countering specific ills in the elderly.

8. There are two approaches to restore the present unbalanced accumulation of knowledge, both of which require a deliberate increase in the proportion of our national educational and research budgets that are devoted to gerontology.

An early objective must be to provide new educational resources and research training programmes backed by appropriate funds for research. More support must be given to research in fields other than biochemistry. While there can be no doubt that ageing will be ultimately explained in molecular terms, it is not easy to integrate the findings of molecular biology into the levels of organisation familiar to the physiologist and experimental psychologist. An awareness of this methodological gap is important to the future balanced development of gerontology to provide the necessary basis for treating diseases of the elderly.

Letter from the Biochemical Society

Thank you for giving the Biochemical Society the opportunity to respond (*vide* your letter of 3/3/87 to Miss D. Stilwell). Our views of course have in mind molecular applications in biomedicine.

I have two points of a general nature to offer for the consideration of the Sub-Committee:

1. The proper areas for application of priorities in medical research are:

   (i) *clinical procedures for diagnosis and/or treatment*—defining the clinical problems and evaluating clinical management by existing and novel methods. This work should interdigitate with the Health Service efforts. Pharmaceutical companies cannot undertake this type of work, and if we want new and improved therapies, DHSS + DES + MRC must tackle the job. Laboratory scientists cannot fill the gap; they can deal with scientific aspects when the problems have been defined by clinicians (drugs with minimal side-effects; prostheses; imaging equipment, and so forth), and in most cases, laboratory scientists in industry will solve the problems eventually.

   (ii) *basic scientific research*—dealing broadly with phenomena/details underlying medicine in its widest sense. Areas of Biochemistry that represent the advancing frontiers relating to biomedical research include molecular biology, gene structure and function, protein structure and function, neurochemistry, nutritional biochemistry, immunochemistry, hormone biochemistry, recombinant DNA applications, protein engineering, targetting, inflammatory mechanisms, and other areas of biomedicine investigated at the molecular level. Concentration of the research effort should be on acquiring the *fundamental understanding* ultimately essential to secure progress. We view this type of work as excluding the research undertaken by pharmaceutical companies.

2. We believe that the principles are very clear and that implementing them is not a matter of difficulty until it reaches the point of resource allocation among worthy projects perceived as being too numerous to finance *in toto*.

I shall deal now with the questions you raise in paragraphs (a) to (i).

(a) Priorities may be set for research which is of a "developmental" or "testing" nature—for example improvements in microsurgery, invalid carriages, hypotensive drugs, ante-natal diagnosis. The priority for this type of research would be dictated by urgencies in the perceived needs of the nation's health. Otherwise, and more importantly, priorities for real and basic research have not been set in the past and probably should not be set. The support of medical research stems from initiatives in the medical and scientific community, and the relevant agencies respond after assessment by peer review. This system works well and should be maintained. In the past, the MRC has been outstandingly successful in identifying individuals, groups and institutions whose initiatives have been thereby supported and have been excellent in achievement.

There are no known (to me) examples of notable achievement in medical research that have come by way of centrally-directed priority programmes, in the UK or any other country.

(b) The balance changes according to progress and new initiatives. Less important areas tend quickly to shrink and to be replaced by new and expanding areas that are readily recognised by the practising professionals in the medical and biomedical community as being important. However, there is no point in funding research in priority areas (but unfashionable ones like mental retardation, community health in ethnic groups, physical handicap) if researchers of suitable calibre are not available, or are unwilling, to undertake the task. This would be a waste of public monies and would not see achievement of objectives. On the other hand, proposed research of high quality by skilful and experienced researchers should be supported provided also that the feasibility and relevance factors are acceptable. This policy of support will undoubtedly create a body of relevant knowledge that will ultimately secure progress in health matters.

(c) The answer to this is "Yes", and it is implicit in (b) above. However, it is important to understand that appropriate adaptation implies training of young people to change to new research thrusts in line with new and/or changing needs in the health of the nation. Therefore the maintenance of a fully-trained research workforce is essential in adaptation.

(d) Within academic institutions, where most biochemical research is prosecuted, priorities emerge from success in securing funding from public agencies such as DHSS and MRC. This implies that peer assessment and peer interactions in medical research identify priorities. International liaisons further help create and confirm these perceptions of need and relevance.

The virtual elimination of the dual support system (UGC: Research Councils) has of course seriously inhibited progress here.

(e) Yes. The network is quick and effective by way of the medical and scientific press, and meetings of learned societies and professional organisations. Recent financial cut-backs (libraries in Universities, Medical School; funds for attendance at scientific meetings) are seriously impeding the access of medical researchers to the network.

(f) With regard to duplication of research, this is almost entirely an administrative and bureaucratic fantasy. A measure of independent research is good. Scientists do not wish to do what someone else is doing so their activities are self-regulatory in the best way, provided that funds for gaining access to the communications network are adequate. It is our experience that wasteful duplication is very rare. The peer review system virtually prevents duplication anyway.

(g) The answer here is "Yes" in respect of 1(i) certainly above. Examples are too numerous to quote, and I suspect that nearly all such recent research has been quickly translated into improvement in patient care. Taking the point in reverse, all obvious improvements in patient care stem from prior research. With regard to 1(ii) above, the translation is less obvious and less speedy. Nevertheless all improvements in diagnosis and treatment in areas such as genetic disorders; endocrine disorders; infections by viruses, bacteria, fungi and protozoa; cancer; haemostasis; thrombosis; immunotherapy; radiotherapy; chemotherapy; inflammatory disease; drug addiction; nutritional imbalances. Many of these have emerged from basic biomedical research at the molecular level, most have notable inputs from medical research in the UK, and all have quickly benefitted from advances made within the relatively recent past.

On the matter of health education there is absolutely no doubt that the community at large is becoming better informed on new achievements in health matters stemming from current and recent research, and, *more importantly,* there is a substantial and positive transmission from researchers to biological and medical students who are taught in an environment in which timely biomedical and medical research is conducted.

(h) The training as it stands should not be altered but it should be supplemented to fill an obvious gap, namely the deficiency of training in experimental techniques in the medical curriculum.

Substantial support should be given as a matter of urgency to intercalated BSc Honours Degrees (with MB, ChB) in Bacteriology, Biochemistry, Genetics, Immunology, Molecular Biology, Pharmacology and Physiology. It is vital that we produce a cadre of medical doctors trained also in the cognate basic biosciences, that they should have postgraduate training in basic research (PhD) and that their career development is not hindered in basic clinical research by following this educational route rather than the professional College route. Notwithstanding that, an appropriate work-force of the BSc:PhD variety should be maintained in the biomedical disciplines. Career structure and the financial support for it are therefore important factors for the foreseeable future.

(i) Although the financial consideration is not the only one in maintaining and improving medical research, it is a centrally important one. More money has to be made available for biomedical and medical research. Lest there be any misunderstanding, this is an area of funding that cannot and should not be transferred from the public purse to the private sector. The recent financial pressures to relieve the public of this spending responsibility in research is especially ill-advised in the medical context.

One inference that I have drawn from paragraph (d) of your letter is that funding from Charitable Bodies should feature in Government plans for medical research. The role of these Bodies is to use the gifts of benefactors to do good as they think best in the light of the inevitable imperfections of the DES, DHSS, SHHD, UGC and NHS. For Government agencies to plan for and create inadequacies that the Charities would attend to would be immoral and unacceptable. There is of course no objection to Government agencies offering representatives to sit on the governing bodies and research committees of the Charities in an advisory consultative and non-voting capacity. Indeed, the most constructive suggestion we can offer in this respect is that there should be a measure of planning and integration of activities among DHSS, SHHD, DES, MRC and the charitable medical foundations such as the Wellcome Trust, the British Heart Foundation and the Cancer Research Campaign, with reciprocal non-voting representation on governing bodies and committees.

Professor H M Keir
Chairman, The Biochemical Society

April 1987

Supplementary evidence from the Biochemical Society in the form of a letter to the Society from Professor Maden, Department of Biochemistry, University of Liverpool

Request for Evidence—House of Lords Select Committee on Science and Technology, Sub-Committee II—Medical Research

I am writing in reply to your request for evidence on the above subject, so that you can forward my response to the House of Lords Select Committee.

It is now widely accepted that basic biomedical research in the United Kingdom is very badly underfunded. Evidence for this comes from the large numbers of alpha-rated research project grant applications which go unsupported due to lack of funds. I expect that the Medical Research Council and possibly the Science and Engineering Research Council will present up to date information on this matter. However, as Head of a large Biochemistry Department with strong commitments to several aspects of basic medical research, I should like to point out how important it is for research workers who have consistently obtained alpha ratings for their proposals to obtain the funds which they need for converting these proposals into accomplishments. The present crisis in research funding makes it very difficult indeed for even the best research workers to plan sufficiently ahead for their work to progress smoothly and efficiently.

It is simply not true to say that central government cannot afford to support basic biomedical research more generously. It is a question of priorities. This government should place higher priority than it does on the funding of biomedical research, on which future advances in patient care will largely depend.

Professor B E H Maden
Head of Department

May 1987

Memorandum by Bloomsbury Health Authority, Nursing Research Committee and Chief Nursing Adviser's Department

The nature of nursing research

Nursing research is complementary to medical research and not subsidiary to it. It draws on a variety of theoretical and methodological frameworks, eg Biology, History, Economics, Psychology and Sociology, in addition to Nursing. If the nature of nursing research is to be recognised, there is an urgent need to raise the profile of nurse researchers, for instance on ethics committees and funding bodies.

Research training and experience

Traditionally, research has been regarded as the prerogative of graduates. Whilst an increasing number of nurses are graduates, most have chosen the more usual hospital based training. Many of these are interested in and able to participate in research. It is essential that this is encouraged.

One of the ways of doing this is integrating research findings into nurse education. In addition, research methods should be taught during basic training.

Career structure

There is currently no clear career structure for nurses wishing to undertake research either as full time researchers or in conjunction with other posts. Postgraduate opportunities are few and those at post-doctoral level, almost non-existent. Research opportunities should be seen as a priority when reviewing nursing career structures.

All district health authorities should have at least one full time research nurse who can co-ordinate local research projects, ensure that research findings are incorporated into clinical practice and initiate new research projects.

Funding

"Like any other professional activity, nursing research requires resources sustained over time, if it is to survive and prosper."

(Salter B, 1985 Journal of Advanced Nursing, 10, p155)

Nurses are the biggest occupational group in the health service, yet in 1980–81 the Nursing Services Research Liaison Group's allocation was only 2.7 per cent of all DHSS research funds. Other sources of funding are limited and need to be expanded.

General research initiative

There are a number of issues in health care which require urgent attention as follows:

1. The impact of change on nurses and nursing.

2. The effect of changing philosophies of health care on the client group.

3. Demographic changes: implications for health service provision in general and nursing in particular.

4. Equality of access to health and nursing services.

5. Recruitment and retention of nurses.

Specific research initiatives

With the focus of health care shifting from the hospitals to the community, nursing research is needed into the different ways in which care can be delivered, e.g. in the client's home, in a small nursing home, in a community house. Research studies should concentrate on the community care of the elderly, the mentally ill, the physically disabled and those with learning difficulties. Other specific areas for nursing research are:

1. The development of objective measures of effective nursing care to facilitate accurate planning for nurse staffing and skill mix.

2. The use of computers to facilitate communication between nurses and other members of the health care team both within the hospital and in the community.

3. Studies of patient handling systems to avoid unnecessary manual lifting sometimes resulting in back injuries to nurses.

4. Investigation of nursing procedures which could be automated thus freeing nursing time for other aspects of care such as health education and counselling.

CONCLUSION

Nursing research must be seen as a priority to improve nursing care, to extend the knowledge base of nursing and to make the best use of the nurse's time.

Memorandum by Sir Christopher Booth, Clinical Research Centre

CLINICAL SCIENCE

Clinical research as we know it in Britain today had its origins in France and Germany during the 19th Century. It was in Paris that the modern medical clinic was born and in Germany that there developed academic departments in clinical subjects in the Universities, headed by professors who had their own laboratories and assistants and who prosecuted research. British clinical science was also greatly influenced by events in the United States where in addition to the example of the German Universities, philanthropy was to play an important role in the development of modern academic medicine.

American philanthropy grew out of the period of expansion that followed the ending of the Civil War, a period associated with the growth of new industries that were vitally important to the emergent economy of the modern era. These developments of modern capitalism led in turn to the progressive accumulation of riches by an elite group of industrial entrepreneurs who included Johns Hopkins, a railway developer, John D. Rockefeller, whose fortune was based on oil, and Andrew Carnegie, the formidable steel magnate. With enormous wealth at their disposal, all turned to philanthropy and both Hopkins and Rockefeller, through the benefactions they made to the institutions that bear their names, were to play a pivotal role in the development of medical education and research in the United States. The German pattern of organisation of medical teaching and research was developed in the United States by the first Professors at the newly founded Johns Hopkins Hospital Medical School in 1889. Many of them, including Osler and William Welch, had studied in Germany. The German system was reflected in the foundation of the clinical centre associated with the Rockefeller Institute when it was established in New York City in 1901. It was also the German model of medical education that so deeply influenced Abraham Flexner, whose report on medical education in the United States in 1910 played a major role in reforming the American medical schools and stimulated clinical research in the modern era.

In Britain clinical research developed more slowly. There had been some excellent research work in the clinical field during the 18th Century. During the 19th Century, there were still examples of outstanding achievement in clinical research in this country, Bright's work on renal disease and the studies of Addison and Hodgkin being examples, but despite Lister's innovations, Sir James MacKenzie's pioneering work, and the studies of Manson and his pupils, British medicine in general fell behind that in the Continental schools, largely because there was no University base for clinical research. It was not impossible for brilliant men to achieve, for in the early years of the century, Archibald Garrod published his pioneering work on biochemical genetics and Thomas Lewis, who was much influenced by MacKenzie, began his studies of the heart beat. But there were two developments that were to be of great importance in the creation of opportunities for clinical research in this country at that time. The first was the establishment of full-time academic departments in clinical subjects in the medical schools following the report in 1913 of the Royal Commission on University education in London, chaired by Lord Haldane. The Commission had been greatly influenced by the evidence given by Abraham Flexner and Sir William Osler, first Professor of Medicine at the Johns Hopkins Medical School and now Regius Professor in Oxford, who had been scathing in his condemnation of the London teaching schools. With their experience of developments in medical education in the United States at that time, both strongly commended the German pattern of medical education to the Commission which responded by recommending that a limited number of full-time Chairs be established by the University of London in the medical schools in the capital. Garrod, at St. Bartholomew's Hospital, was the first to be appointed in 1919, but he left to succeed Osler as Regius Professor in Oxford before taking up his post.

The second important development was the foundation in 1913 of the Medical Research Council, originally the Medical Research Committee, to whose service Sir Thomas Lewis was to be recruited in 1916 as the first full-time clinical research worker in this country. Under the aegis of the MRC Thomas Lewis was later outstandingly successful in creating the Department of Clinical Research at UCH. It was Lewis who was the forerunner of what we understand as clinical research in Britain today.

Before the opening of the British Postgraduate Medical School at Hammersmith in 1935 and the setting up of the clinical school in Oxford a year later, clinical research in the universities and medical schools made only a faltering start. At Hammersmith, the original finance came from the Treasury and the LCC but, as in the United States philanthropy was also to be of great importance in this country. The Oxford clinical school, now so outstanding, owes its origins to the success of the Morris motor car, for it was the benefactions of Lord Nuffield that enabled the University of Oxford to establish its first clinical Chairs. In July 1936, Lord Nuffield had heard Sir Farquhar Buzzard, then Regius Professor of Medicine at Oxford, deliver his presidential address in the Sheldonian Theatre to the British Medical Association, an address

in which he had made an eloquent plea for the establishment of a post graduate clinical school. Nuffield was immediately persuaded. Always a man of action, he did not delay and by the end of the year the Oxford Chairs had been founded. It was in that same year that there was another important event. Sir Henry Wellcome died in the London Clinic in July leaving his pharmaceutical empire to the Trustees who have guided the affairs of his Trust during the past half-century, and whose contribution to clinical research has been of the greatest importance.

Clinical science today includes a wide range of subjects ranging from epidemiology to studies of individual patients in depth and the laboratory analysis of specimens or tissue. It also involves the study of experimental models of physiology and disease in animals where necessary. Lewis in his time believed that clinical science was a specialty and a discipline in its own right in the same way as pathology or physiology. He considered that the clinical scientist should not primarily be involved in the day-to-day problems of clinical practice, where clinicians devoted their energies to the diagnosis and treatment of often obscure cases. The routine diagnosis and treatment of patients should, he believed, properly belong to such practising clinicians, but the clinical scientist should be in charge of his own beds and laboratories and there concentrate on the study of the natural history of selected diseases.

Lewis' view of clinical science has been overtaken by a number of important developments in this country. A generation ago clinical research was still predominantly the preserve of University Departments of Medicine, Surgery and Pathology. Since the end of the Second World War, however, clinical research has greatly widened its scope as a result of the emergence of new subjects. Many have been associated with the development of new technology, for example cardiac surgery, organ transplantation, intensive care, modern molecular genetics, imaging techniques and all the technologies that now govern diagnostic departments of pathology. Epidemiology was greatly stimulated by the pioneering work of Doll and Bradford Hill and subjects such as community medicine, geriatrics, social psychiatry and general practice are now making a significant contribution to clinical research in this country.

Specialisation has had a particularly important influence on clinical research. Instead of the wide-ranging interests of the clinical investigator of Lewis' time, most modern clinical scientists are brought up to the practice of a clinical specialty. Such individuals have increasingly tended to look for support to scientists in the basic sciences to help in their research, so that clinical science does not stand alone, as Lewis envisaged. Since Lewis' day there has also been a dramatic change in the nature of clinical research. Lewis was a protagonist of the school of clinical physiology and it was physiology that was the driving force of his own work. His views had an important influence on a whole generation of his successors and to this day the Medical Research Society, which Lewis founded, remains greatly influenced by a physiological view of clinical research, which still permeates the activities of too many departments of academic medicine in the Universities. The situation in clinical research has been markedly changed in recent decades by the scientific revolution that has overtaken biology and medicine with the impact of the new pharmacology, immunology, biochemistry and particularly by developments in molecular and cell biology.

Why is there a need for clinical research? So far as the nation is concerned support for basic scientific research is an obvious requirement and is very easy to justify in view of the extraordinary success of British biologists in winning Nobel Prizes. In addition, however, we need clinical research and for four main reasons. Firstly, as part of the life sciences it contributes to the overall body of scientific knowledge from fundamental studies of man in health and disease. Secondly, it develops and applies advances in the basic sciences and in technology to the effective investigation and treatment of human disease. Thirdly, clinical research has the responsibility of maintaining a constant assessment of both new and existing methods of clinical practice. Finally, it ensures that teaching at both undergraduate and postgraduate level does not degenerate into dogma.

Financial support for the clinical research community in this country is derived from a number of different sources. The Government makes a major contribution through its support of biomedical science. Its support for clinical research also includes research carried out under the auspices of the Department of Health and Social Security but the majority of this work is orientated to Health Services Research or health economics. In addition, Regional Health Authorities have a certain limited budget for the support of research at District level and most of this is allocated for clinical research. The laboratories of the Public Health Laboratory Service, a nationwide organisation with a specific responsibility for the control of infectious disease, play an important role in the national research effort in microbiology, and in the epidemiology of communicable disease.

The contributions of the pharmaceutical industry to clinical research in Great Britain are difficult to quantitate. Yet it is clear that the laboratories of the major industrial concerns are of vital importance, particularly in drug and vaccine development. Several of these laboratories, for example those at the Wellcome Foundation at Beckenham in Kent, have an important commitment to basic as well as applied research.

One of the most significant features of the British clinical research scene, and in this it contrasts with other European countries such as France, is the major importance of the private foundations for the support of both basic and applied research. The Wellcome Trust, which receives the profits from the

pharmaceutical company, the Wellcome Foundation, now disburses more than £40 million per annum as a result of the release to the open market of a proportion of its shares in the Wellcome Foundation.

The Wellcome Trust has been so important to clinical research in this country that it is worthy of special consideration. Sir Henry Wellcome, founder of the great pharmaceutical enterprise which bears his name, was a product of that same technologically exciting and entrepreneurial American society of the later years of the 19th century that had produced Rockefeller, Johns Hopkins and Carnegie. Originally an American from the mid-west, Wellcome had worked at an upcountry drugstore owned by an uncle and he had been a travelling drug salesman. In 1880, however, struck by the commercial opportunities opening up in Great Britain, he formed a partnership with Silas Burroughs with the intention of introducing into Britain the manufacture of readymade pills, which he called "Tabloids", a new technology at a stage of active development in the United States. It was an immensely successful venture. Silas Burroughs died in 1895 and when Wellcome followed him to his maker more than forty years later, he controlled one of the largest industrial fortunes in this country. The puritanical son of a missionary father, he was, like John D. Rockefeller, imbued with a moral responsibility towards his fellow men and their misfortunes, and it was this that guided many of his actions throughout his long life. At his death he left his entire fortune and his commercial enterprises to Trustees who were to continue to control his business as sole shareholders. The Wellcome Trust, created under the terms of his Will, has had a major influence through the years on medical and scientific research as well as on tropical medicine and the study of the history of medicine. The Trust has been of extraordinary importance to a whole generation in this country. It has given a start to their careers to many young men and women. It has provided vitally important support to our universities and medical schools during the recent period of severe retrenchment. Without the Trust's imaginative schemes for the support of clinical research fellows, senior lectureships, special awards to prevent individuals joining the "brain drain," and linked appointments for basic scientists working in clinical departments, the position in the medical schools today would be nothing short of disastrous. For whole departments, the enthusiastic encouragement of the Trust and its officers has been of vital importance in the development of new initiatives. The Trust has always been more receptive of new ideas than other grant giving bodies in this country and is always prepared to look at novel ways of doing what needs to be done. Within its elegant premises in Regents Park, it tends to lend a more understanding ear to the problems faced by research workers than do more formally constituted bodies. For those working overseas, in Thailand, India, East Africa or Belem, the Trust has given support that has often been far more than merely scientific. As the Director of the Trust has pointed out: "A flexible, relaxed, helpful body is of great importance to those who seek funds". The academic community of this country is particularly fortunate that the Wellcome Trust has been just such an organisation.

There are many other charitable organisations that have been of great significance in the support of clinical research. The Imperial Cancer Research Fund, the Cancer Research Campaign, the British Heart Foundation and the Leukaemia Research Fund support a wide range of clinical research in their respective fields. There are also many smaller Trusts concerned with specific diseases such as multiple sclerosis, rheumatism, cystic fibrosis, coeliac disease and so on. Together with the major Foundations, these charitable organisations now contribute almost as much per annum as does the Government through its support for the Medical Research Council. Such funds are of particular importance in providing an essential buffer to research workers seeking support for their work, as well as acting as a complementary source of income to that available from the Government.

Most people will tell you that resources for clinical research are declining in this country. The question, however, is not simple. The answer depends on a number of factors which include the proportion of money available in our community between the private and public sectors, the relationship between the support for basic science compared to clinical research, and the support being given to universities where the majority of clinical research is carried out. Recently, however, it has been the progressive erosion of support for the universities, as a result of deliberate Government policy, that has caused the most serious problems. By 1990, if present policies continue, it has been estimated that the universities will have suffered a 30 per cent cut in real terms in a decade. The Government's policies are having a major impact on medical schools at present and murmurings about closures are already being heard. These are matters that should greatly concern all members of the medical profession for we share a loyalty to our medical school and to the teachers who guided our first faltering footsteps in medicine. Some are in serious danger of losing their alma maters. University clinical staff, with their undue responsibility for teaching and clinical care in our medical schools, must give priority to these activities and the swingeing reductions in academic staff which have taken place nationwide are unquestionably leading to a reduction in the amount of time and energy that can be devoted to research. There is evidence in Britain that this is being reflected by a reduction not just in morale but also in requests to the MRC for support for clinical research, particularly from the young and from new recruits. The university, as a place of "light, liberty and learning," to use Disraeli's phrase, is increasingly under attack.

Until now, the one budget that was preserved against cuts by the Government was the research budget. This is no longer the case. In recent years there has been an increasing reluctance on the part of the Government to support science in Britain as effectively as is necessary to maintain this country's scientific position in a competitive world. The sad feature of this erosion of Government research support, which is a reflection of an overall Government commitment to reduce public spending so that taxes could be

reduced in the last pre-election budget, is that it is probably not what the public wants, particularly in respect of medical research. The charitable sector of medical research funding is increasing every year, suggesting that the average citizen is favourably disposed to medical research. Yet the British system, which incorporates the funding of medical research within an overall budget for science and which, therefore, effectively insulates the medical research budget from political pressure, may well be unable to reflect this public will as far as medical research funding is concerned. The lobbying of Members of Parliament, for example, might conceivably result in an increase in scientific funding overall, but there would be no guarantee that the Advisory Board for the Research Councils would channel such an increase in funding into medical research and no further guarantee that the Medical Research Council would then devote that money to clinical research. This is particularly galling at a time when the prospects for clinical research have never been so challenging or exciting.

So far as Government support for research is concerned the MRC unquestionably requires additional resources. Where are they to come from? The inescapable conclusion is that the government should reconsider its priorities. Government support for defence research projects accounts for as much as half of United Kingdom expenditure on research—vastly greater than the 10 per cent figure for Germany or 33 per cent for France. This is clearly an intolerable position for a European island, no longer a great power, off the north coast of a great continent. As members of a noble profession whose work depends on research we must persuade our legislators to change their policies. The academics have been taken to task for not being more passionate about it all. Perhaps, though, "we rather bear those ills we have than fly to others that we know not of. Thus conscience doth make cowards of us all."

There is one resource, however, that is not declining in either quality or quantity in medicine, and that is the young. Most European countries are producing more doctors than they need and the grim spectre of unemployment has already began to stalk the wards of even our best hospitals. This is at a time when the intellectual quality of entrants to medical school has never been higher. After their period in medical school this remarkable galaxy of talented scholars should emerge as a human resource as eager to discover as to cure. Unfortunately, this does not seem to happen as frequently as it should. It remains uncertain what happens in medical schools to turn an open and enquiring mind at entry into a conformist junior resident who wants to get into practice as quickly as possible, but it may in some way be a reflection of the organisation of University departments responsible for clinical teaching in this country.

The organisation of clinical academic departments of medical schools in Britain is quite different to that in the United States where for the most part university departments follow the pattern established following the implementation of the recommendations of Abraham Flexner's report. American departments are very much larger, they provide academic staff with more time for research and they are comprehensive. The professor in the United States University Department of Medicine or Surgery for example is not only head of the specialty subjects within his field, but also chief of service of the hospital department. With the help of senior staff acting as attending consultants, the routine investigation and treatment of patients is undertaken by the residents and interns (registrars and house staff). They are responsible to a chief resident who reports to the Head of Department, as chief of service. Other specialty Units within the department, for example gastroenterology, cardiology and infectious disease, are led by University staff and their head often holds the rank of professor himself. With his staff, he provides both a service in his sub-specialty and acts as a consultant throughout the hospital. This system ensures that the academic members of the university clinical department are not overwhelmed by clinical commitments, and many American academics spend no more than a month or two a year as attending physicians. Clinical academic staff in American schools, therefore, have greater freedom than their counterparts in Britain to develop research interests with a strong laboratory base. They also have access, through the National Institutes of Health and the wealthy American charitable foundations, to richer sources of research funds. This has sometimes led to an over-emphasis on basic science at the expense of clinical, but at the same time it has been the strength of the American pattern of medical education and of its commitment to clinical research. It is also a system within which new initiatives can rapidly and readily be undertaken.

In Britain the situation is different. At the end of the First World War, following the report of Lord Haldane's Royal Commission, the universities began to establish clinical academic units in the medical schools headed by full-time professors, who were debarred from private practice. Osler, in his evidence to the Haldane Commission, had called for "an active invasion of the teaching hospitals by the Universities". What in fact was achieved, however, was no more than a bridgehead. In contrast to the situation in the United States the academic units were single firms in a particular specialty and they existed alongside hospital units already established in the teaching hospital by men working part-time, who also undertook private practice. As Francis Fraser pointed out when he was Professor of Medicine at Bart's in the 1920s, the students could see Lord Horder arriving in his Rolls Royce and this sort of career was at once more appealing than the rigours of laboratory work. The professors were not heads of service in their subject and they had no control over other specialty interests except for those they controlled in their own unit. This arrangement has had unfortunate consequences. Since Professors tend to breed other Professors, the British system perpetuates the specialty interests of the existing Professors, to the detriment of the development of new subjects. This explains why so many academic departments have persisted for so long in encouraging clinical physiology, at the expense of new science. Vicariously, however, the Professors were able to influence events beyond the confines of the academic unit by encouraging the teaching and

research activities of their NHS colleagues, but the academic departments remained relatively small and the average professor in a clinical medical school remains a far less powerful patron of the young than his American counterpart.

The only exception to the Haldane Model of the academic department in Britain is the Royal Postgraduate Medical School at Hammersmith Hospital. Stimulated by Sir Francis Fraser, first Professor of Medicine at the School, Hammersmith developed a system that paralleled that in the American schools. The School made an agreement with the Health Authorities that the consultant staff of the hospital would be full-time academics, holding positions in the university, whereas the junior medical staff, like the American residents and interns, would be paid by the hospital. This arrangement effectively established the professor in the major clinical departments as chief of service on the American pattern. The heads of sub-specialty units, however, did not have the same freedom as their American counterparts, firstly because they were not so lavishly provided with staff and secondly because the total responsibility for their sub-specialty rested on them. They also provided an emergency take-service at least once a week in rotation with other units. The Hammersmith model has been reasonably effective in providing opportunities for clinical research and for the training of medical teachers. It is still, however, a model in which the major emphasis has been on the investigation and treatment of individual patients and it is for this reason that Hammersmith has established a reputation for tertiary referral work and the exploitation of new and complex technology.

Although clinical departments in the Universities have served this country reasonably well through the years, particularly in teaching, there is evidence to suggest that in the next fifteen years, which takes us to the 21st Century, they may be increasingly unable to adapt to the challenges facing clinical research in the modern era. There are in the British system factors which provide a constant resistance to change. One of the major problems facing clinical research today is the orientation of the National Health Service and the medical schools to a "systems" approach to medicine. In the NHS medicine is practised according to specialties which are system orientated. There are cardiologists, gastroenterologists, neuro-surgeons and so on, and this is a reflection of a centrifugal fragmentation of the older subjects in medicine into more and more parts. The medical schools follow this pattern so that undergraduate curricula are often designed to a "systems" model which follows NHS specialties. At postgraduate level the Royal Colleges with their commitment to higher training follow the same specialty and systems model. Clinician scientists tend simply to line up their research alongside this "systems" model. The problem for those who are trying to influence clinical research in the modern era by applying modern biomedical science to clinical problems is that the scientists who are recruited, whether they be clinical or non-clinical, are not interested in an approach by systems. Science, in contrast to the divergence evident in clinical practice, has not been fragmenting but is converging. The Nobel laureate, Arthur Kornberg, perceived this paradox when he pointed out that the most profound development in medical science "is the confluence of many discrete and previously unrelated medical science subjects into a single unified discipline. Anatomy, physiology, biochemistry, microbiology, immunology and genetics have now been merged and are being expressed in a common language . . . by reducing structures and systems into molecular forms", he went on: "all aspects of body form and function blend into a logical framework."

This development is reflected by the desire of the modern breed of clinical scientists to be unshackled from a rigid "systems" approach An individual interested in type one immunological responses, for example, may be investigating allergic responses in skin, gut and lung. A clinical molecular biologist interested in apoprotein genes is involved in patients with atheroma, the genetics of the insulin receptor in diabetes, and may also need to study the molecular biology of Wilms tumour of the kidney, to say nothing of his involvement in the cloning of an oncogene. A clinical scientist interested in the molecular biology of collagen disorders, initially a dermatologist, may find himself investigating the molecular basis of berry aneuryms of the brain, since they too may be due to an abnormality of collagen synthesis. A cell biologist interested in organelles may have to study liver, gut, blood vessels and leucocytes. For such individuals—and they are all examples of actual clinician scientists who work at the Clinical Research Centre at Northwick Park—there is a need for institutions and academic departments that are free from the fetters of system and organ orientated approaches to clinical science.

There is also the question of time. The modern clinical investigator who wishes to be internationally competitive in the field of molecular or cell biology can afford to spend only a limited amount of his time in the clinic, perhaps not more than 20 per cent. It is essential that he build up his laboratory work, usually in association with a multidisciplinary group that includes basic scientists, who will have no respect for him if he is simply one of those clinicians who nods into the laboratory once a week and enquires how things are going. The present structure within the medical schools, with their orientation to a system-based curriculum, may be effective in subjects orientated to diagnosis and therapy, such as departments of surgery and radiology. It is, however, too inflexible to allow the development of clinical scientists who have enough freedom to do what they want or to develop new approaches rapidly. The present models available for clinical research in this country are unlikely to be adequate for the future. Flexible organisations are urgently required where, in addition to studying the traditional specialty subjects, clinical scientists have the freedom to develop their own ideas in their own way untrammelled by an overwhelming NHS commitment.

It is against this background that we must consider how we should now seek to encourage clinical research. The MRC has not always got things right throughout its history. It was parsimonious in its dealings with Howard Florey in the development of penicillin and it did not want to be involved in the reproductive technology introduced by Steptoe and Edwards. Perhaps the Council members of that time had been put off by Aldous Huxley's *Brave New World*. But I do believe that through the years the British public has had good value for the money that has been invested in the MRC. It has great achievements to its credit. It is a national institution whose high international reputation is fully deserved and of which the nation should be proud. British work in molecular biology and in a whole range of other areas of biomedical research, which include the contributions to modern epidemiology of men such as Sir Richard Doll, all indicate that in terms of research achievement per pound spent the British public is getting good value for their money.

Approximately 60 per cent of the MRC's budget is allocated in-house—that is to its Units or to its major institutes, the National Institute for Medical Research at Mill Hill, the Clinical Research Centre at Northwick Park and the Laboratory of Molecular Biology in Cambridge. Much of the remaining 40 per cent of the MRC budget goes in programme or project grants to universities and their staff, which are awarded on a competitive basis by the various Research Boards of the Council and to awards for training at home and abroad. At the same time Council provides support within Universities to exceptional individuals by giving them their own Unit, the staff then being appointed and remunerated by the MRC. The Unit for the study of Molecular Haematology at Oxford, under the direction of the Nuffield Professor of Medicine, Professor David Weatherall, is just such an example. Sir Thomas Lewis' outstandingly successful Department of Clinical Research at UCH was another example of MRC support for a distinguished clinical scientist at Unit level.

It was to Lewis' vision and to Homoworth's execution that the modern generation owes the establishment by the MRC of its own Centre for Clinical Research in association with the District General Hospital at Northwick Park. The hospital at Northwick Park, opened in 1970, provides a comprehensive service to a defined community in Harrow. It is a district hospital of 800 beds, of which 160 are allocated to the MRC for research purposes. These beds are available for the study of "the natural history of selected diseases," to use Sir Thomas Lewis' phrase. The CRC model is, therefore, quite different to that in the universities in this country, and it is poorly understood by those whose research background is limited to University work. It has made no attempt to duplicate the tertiary referral work so well carried out at Hammersmith. The facilities at Northwick Park have been particularly valuable in encouraging long-term studies of human disease as envisaged by Lewis when he first suggested to Sir Walter Fletcher in 1929, then Secretary to the Council, that the MRC should establish its own Institute for Clinical Research. The programmes of research arise from a desire to encourage new science on the one hand and to reflect national concern for human affliction on the other. In addition to research programmes in molecular and cell biology, for example, there are also important initiatives in the biology of the brain in schizophrenia, alcoholism and its prevention, vascular disease, sexually transmitted disease, obesity, allergy, arthritis in children, diarrheal illnesses and diseases as banal as the common cold, for the MRC's Common Cold Unit in Salisbury is an important outstation of the CRC. Northwick Park provides a unique environment where clinician scientists, in close association with basic scientists, can develop laboratories which are independent of NHS requirements, which can be used flexibly and where new developments are not governed by the need to subscribe to a particular curriculum, as is naturally the case in the medical schools.

In the present climate of financial stringency, however, it seems increasingly uncertain whether the nation can afford to support two major institutions involved in clinical research—one at Hammersmith and the other, only five miles away, at Northwick Park. For this and other reasons a recent report to the Medical Research Council has recommended that the CRC should now be merged, on one site, with the Royal Postgraduate Medical School, a suggestion that would bring together a major activity of the University of London in clinical research as well as that of the MRC. There has naturally been some scepticism as to whether this aim may ever be achieved, for it will be expensive and will take a long time. But whatever happens in the future, I believe that the multidisciplinary model of clinical research that has been developed at Northwick Park where there is close association between different research groups, and where men may choose to work full-time in research must at all costs be preserved.

In the coming decades it is possible that gene therapy may become a reality and there is no doubt that genetic disease will be preventable on a significant and wide scale. We may well also begin to unravel the biology of the brain in chronic mental illness. We shall certainly witness the introduction of effective anti-viral agents. Both hepatitis and measles should be eradicated and we shall increasingly know what motivates a cancer cell. In addition, we may well understand how to prevent coronary artery disease.

There is little doubt that the state of clinical research in this country is undoubtedly better than it was twenty-five years ago. Clinical research in many medical schools has immeasurably improved. The spectrum of clinical research has been greatly extended during this period and British clinical research now enjoys a high reputation both in Western Europe and in the United States, where it is generally thought to represent in terms of achievement per pound spent excellent value for money. So why is it that among university professors in traditional clinical subjects in this country, and elsewhere, there appears to be a general spirit of gloom and depression about the current state of clinical research?

The main reason is that the medical academic community in this country does not want to be relegated to the fourth division at a time when opportunities have never been so exciting, the tools provided by basic science so powerful, nor the challenges of human suffering so much in need of the application of the scientific method. University departments have been hard hit by the swingeing cuts in support for our universities, to which I have already referred. There are also economic problems which have resulted from the financial disparity that has developed between academic staff and those who work for the National Health Service. One of the major constraints to the recruitment of young clinicians to research has been the introduction, with the best of intentions, of the system of extra-duty payments for junior clinical staff of the National Health Service. There is no longer comparability in salary between trainees in clinical science and their clinical colleagues in the Health Service to the serious disadvantage of the scientist trainee. He cannot claim extra-duty payments from the university or research Council for the time spent doing laboratory work into the small hours, or writing papers on the results of his work. At senior level a similar disparity in salary betwen clinical academic staff and National Health Service staff has also been created. NHS staff who work full-time are now permitted to do limited private practice for their personal gain. This has encouraged a change of attitudes amongst academic staff. There has been a long tradition in Britain of academic staff working full-time, and if they see private patients and charge fees, the fees go either to their own department or to the medical school. Now as a result of the Government's encouragement of an increase in the private sector nationwide, individual academics, particularly surgeons, obstetricians and gynaecologists, are seeking to do private practice for personal gain, a development which will be to the further detriment of clinical research in this country. While Dr Johnson reminds us that there are few ways in which a man can be more innocently employed than in the getting of money, the Bible warns that the love of money is the root of all evil.

There is also the problem of training. In a previous generation, the clinical investigator who had had a firm grounding in physiology as a medical student, could decide to attack a problem in clinical physiology and simply get going. He now requires further training at postgraduate level not only in research techniques but also in new subjects, and this has to be undertaken as well as postgraduate training in his chosen clinical discipline. He then has to follow that uncertain road which lies between studies of laboratory animals on the one hand, and the more lucrative pastures of clinical and private practice on the other. He has to learn to be sufficiently thick-skinned to pay scant attention to the views of scientists who say that he is not a proper scientist, and to those of his clinical colleagues who say he is not a proper clinician. To undertake postgraduate clinical training to the level required for the acquisition of specialist registration, to do an MSc or PhD degree, in addition to post-doctoral work often overseas in a laboratory of basic science, is the sort of career that the new breed of clinician investigator has to follow. It is a daunting prospect and only the most dedicated are now succeeding.

Other influences have also been at work in recent years to inhibit the investigative zeal of the young. It is unlikely that there has been any reduction in the overall ability of medical students in this field for the enquiring spirit of the human mind is unlikely to vary from one generation to another. It is more likely that in terms of the recruitment of young clinician scientists, it is environmental influences rather than inherent ability that determines attitudes. Perhaps one of the most important of these has been the attack on elitism. Science is associated with an elite, elitism is incompatible with egalitarianism, therefore, in an egalitarian society, science is suspect. For this and other reasons science has been attacked, particularly following the development of nuclear weapons, and populists have at the same time sown a deep mistrust of scientists in the public mind. Modern technology has been under attack and medicine has been portrayed as unfeeling, losing sight of the needs of the suffering individual. Undoubtedly we have been passing through a phase where some of these criticisms have rubbed off on young medical students and there has been a feeling among them that relevance is all important—the desire to cure and care more praiseworthy than to investigate.

The achievements of clinical science, and particularly of university clinical departments, have also been criticised. The incursion of the university into undergraduate teaching hospitals in London, even where no more than a bridgehead has been established, has not been considered an unmixed blessing by some of the more old-fashioned consultants. A more serious and significant critique of clinical science in this country, however, was made by Lord Platt, the first full-time Professor of Medicine in this University and a past President of the Royal College of Physicians, in his Harveian Oration for 1967 entitled "Medical Science—Master or Servant". He had also served as a member of The Medical Research Council. Platt accepted that the application of the scientific method had brought much benefit to the investigation of bodily function and of disease, but he considered that academic clinical departments had hardly been responsible for any of the revolutionary advances in therapy of the previous forty years. He argued that "there had been far too great an emphasis on clinical measurement and a positive obsession with measuring what are now called *parameters* of chronic organic illness to the neglect of other more important problems". He acknowledged that "some real discoveries have been made in academic clinical departments, often in the field of rare diseases such as primary hyperaldosteronism," but he went on to complain "that the accurate study of function in chronic obstructive disease of the lungs, the kidneys and the liver has sometimes seemed more akin to an absorbing hobby than a therapeutic exercise." He thought that too little attention was given to subjects such as mental illness, to the relationship between physician and patient, and to taboo subjects such as sex education. Altogether he was reflecting the view that clinical research should be relevant, a notion succinctly put by A P Herbert who wrote:

I love the doctors, they are dears,
But must they spend such years and years
Investigating such a lot
Of illnesses that no one's got?

Although a single correspondent congratulated his Lordship on his "brilliant account of the misdirected efforts now wasted on certain types of clinical research", it is fair to say that Platt's Harveian Oration caused an outcry from many of the clinical academic professors of that era. W S Peart, in particular, responded with the comment that the medical academic units were a very recent acquisition in many schools, but he admitted that the lack of biochemical and pharmacological training for doctors had been a major drawback. He pointed out to Lord Platt that he was: "grievously wrong in contrasting the understanding of patients and their needs with the scientific aims of medicine. We can keep out the dangerous fools attached to machines", he went on: "as long as we can let in the wise men". Furthermore, he asked what on earth Lord Platt had been doing about it all, since he had himself been a Professor of Medicine, right here, for many years.

Nevertheless, it is possible with hindsight to grant that there was more right on Platt's side than was apparent to his opponents. There *had* been too much clinical physiology and not enough study of the basic nature and natural history of human disease, the major function of clinical science as defined by Lewis. There had been, and still is, too much emphasis on the rare and the esoteric. In addition, during the past two decades few academic clinical departments have had sufficient flexibility to react rapidly to the changes brought about by the new science, a situation that the present cuts in University expenditure are doing little to relieve.

For the future, however, the most important issue is the survival of clinical research. As biologists we can perhaps take heart from evolution, and as scientists we are incurably optimistic. Clinical research is a tender and delicate organism requiring constant care and attention, but as with all other species two attributes are vital—the capacity to adapt to changing circumstances and the ability to reproduce. I believe that clinical science has demonstrated remarkable adaptability. It has already adapted to cuts, which are not always a total disaster since they can enable some effective pruning to be done, and there are few universities or research institutes that do not have some dead wood. It is also increasingly adapting, albeit slowly, to the new science.

But is the clinical research community reproducing itself? Here the most important factor is the recruitment and support of the young. We need, as Sir John McMichael once put it in a memorable phrase, to have the young upon our shoulders, not trample them under our feet. It is for their elders to lead by example and for their teachers constantly to encourage a questing frame of mind, something at which Tom Lewis' most outstanding pupil, Sir George Pickering, so greatly excelled. But in the final analysis if you want to encourage clinical research and you are a professor or a research director what do you actually do? You do what McMichael did so well. You pick a good man at as young an age as you can, you give him all the support he needs (preferably from Wellcome), and you let him get on with it.

Supplementary letter from Sir Christopher Booth, Clinical Research Centre

You will perhaps recall that I have previously submitted to you a memorandum on clinical research today for submission to the House of Lords Select Committee on Science and Technology (Sub-Committee II: Medical Research). A discussion of that paper with Lord Hunter last evening prompts me to write to you. In reflecting on the problems of clinical research at present, I conclude that there are a number of issues that are vitally important to the future of clinical research that should be more fully explored than was possible in my paper. As Director of the nation's only institute for clinical research I believe that it is necessary to set out clearly what we expect from universities on the one hand and national enterprises in clinical research such as those fostered in its own institutions by the Medical Research Council. There is an urgent need to ensure that in both the universities and in the research councils sector we take account not only of the need to encourage effective links between clinical research and the basic sciences but also that we seek to do a great deal more for subjects such as epidemiology, psychiatry, genetics and the behavioural sciences. This last is of particular importance in an era when so much of the burden on the nation's health services is a result of the pursuit of pleasure, as by those who smoke cigarettes, drink too much, eat inappropriately, misuse drugs, develop sexually transmitted diseases or become maimed following accidents to modern cars driven too fast. Unhappily the inalienable right of "the pursuit of happiness" is too often interpreted as a justification for the pursuit of pleasure.

Christopher Booth
Director

December 1987

Letter from the British Anaesthetic and Respiratory Equipment Manufacturers Association (Barema)

Thank you for your letter of 3 March 1987.

BAREMA as a corporate body is not involved in the funding or carrying out of research but is occasionally requested to make introductions between those with ideas and suitable manufacturers.

We are also regularly involved with the DHSS and the Association of Anaesthetists of Great Britain and Ireland in reviewing the safety of anaesthetic apparatus. Through our organisation, our members are therefore kept informed of the problems and need for development of their existing designs of apparatus, and of potential areas for industrial research.

The members of our organisation are substantially engaged in research and I believe that my personal experience in my previous role as Technical Director of Penlon Ltd is typical of most of these companies and therefore forms a basis on which to reply to your enquiries.

BAREMA members are primarily concerned in the development stage of product design and seek partners in the academic medical institutions who are carrying out more fundamental research. It is extremely unusual for any anaesthetic apparatus to be developed entirely by an industrial organisation or even by medically qualified personnel employed by such a company. It is equally unusual for a product in saleable form to emerge from an academic institution without input from an industrial organisation.

Current legislation proposals concerning Product Liability will add another barrier to be overcome before any new idea can be applied to the general public and make cooperative development even more essential.

This partnership approach to the development of medical apparatus is well established and exists at a wide range of levels ranging from sponsorship of Chairs of Anaesthesia through Research Fellowships down to gratuitous cooperation to make a specialised instrument which is unlikely to be commercially viable.

The following replies to your specific questions relate to individual companies, rather than to BAREMA as a corporate entity:

(a) Research in the anaesthetic field is normally related to overcoming problems with existing technologies. Currently, there are areas for improvement which have largely been established by experience in the National Health Service. However Companies have to examine the International Market before agreeing priorities for development, either in-house or by sponsored academic research since the size of the NHS market is seldom adequate to ensure a commercial return on investment.

It is the view of many of our members that the recent and current levels of expenditure on new equipment in our specialty within the NHS have resulted in a serious decline in research into new technology in this country. This has caused damage to the export potential of the industry which will be very difficult to overcome.

Much of the anaesthetic apparatus currently in use in NHS hospitals would be considered obsolete in other countries, having been in use for up to twenty years. We believe that the DHSS is aware of the problem and beginning to face up to the difficulties of correcting past errors, but we must emphasise that a reliable and economically sound home market is an essential prerequisite for industrial investment in research and development.

The needs of the NHS can be well met by the industry if funding for equipment purchases is adequate to provide a market which justifies research investment, but in relation to the general health needs of the nation, it has to be borne in mind that anaesthesia is not a treatment in its own right but an adjunct to surgery and there may be a case for development associated with a surgical procedure, in addition to the need to improve the safety of anaesthetic procedures.

(b) This is difficult to answer from our specialised viewpoint. There are undoubtedly areas of anaesthetic apparatus where the introduction of improved technologies would prevent a small number of deaths. However the benefits of research into problems of AIDS and various cancers would clearly benefit much greater numbers of people. Increased resources would enable the priority list to be extended.

(c) In our experience the main academic research thrust is very alert to the types of change you instance.

(d) At the relatively low level of funding normally associated with projects in our field, the source of funds appear to have little influence on the setting of priorities. However the mechanism by which the research is performed may affect the rate of progress.

In a joint academic/industrial project there may be conflicts, for example, between the industrial need to get to market quickly and the academic need to provide a lengthy programme enabling the Fellow to obtain a Doctorate.

(e) The professional journals provide the major method of dissemination of information and generally do so adequately. Here again there may be substantial differences between industrial and academic partners as to the desirable timing of the release of information.

(f) There is considerable risk of duplication occurring unless confidential reference can be made to some central body. In our case, the DHSS, Scientific and Technical Branch, which has recently become the Supplies Technology Division, has frequently been consulted by member Companies and has provided excellent advice.

(g) A number of major improvements in anaesthetic and respiratory equipment which have been made available recently have had no impact on the safety of the general patient population because of lack of funds to purchase these devices for use in the NHS.

(h) In view of the multi-disciplinary nature of research in our field, management skills are an essential part of the project leader's training. However, this person must also possess a good general knowledge of the research subject. We do not advocate the use of professional "managers".

(i) We believe that the prime factor which would cause our members to increase expenditure on research would be an increase in the funds available for the NHS to purchase the results of their efforts. We greatly welcome the "pump-priming" purchases now being made by the DHSS and we believe that this system should be expanded. At the same time, we believe that there is a need for a secretariat to provide confidential services to avoid duplication, and to make introductions between industrial and academic teams, and sources of funding. The Department of Industry has been most helpful to a number of our members when public funds have been employed, for example under the MAP scheme.

We hope that these replies will be of assistance to you and would be pleased to provide any further information required.

B R Sugg
Secretary

April 1987

Memorandum by the British Association of Pharmaceutical Physicians

Preface

The British Association of Pharmaceutical Physicians was invited to submit evidence to the Committee and specifically asked to indicate any priorities for medical research within the National Health Service.

The British Association of Pharmaceutical Physicians is a professional body with nearly 500 members who are registered medical practitioners working principally in the pharmaceutical industry but also in regulatory authorities. The pharmaceutical physicians are responsible for the clinical evaluation of new medicines and, in particular, the conduct of clinical trials worldwide and the assessment of the efficacy and safety of medicines.

The Executive Committee of the British Association of Pharmaceutical Physicians asked Dr Robert N Smith to prepare the submission on behalf of the Committee. He has worked in the pharmaceutical industry for over 10 years; first with Hoffman-La Roche as Medical Director in Switzerland and then with Glaxo Group Research Limited in England with responsibility in both companies for worldwide clinical research.

Introduction

The National Health Service could provide a unique framework for two types of medical research. First, the large-scale clinical trials of new treatments involving several thousand patients whose progress must be monitored for several years thereafter. The primary or secondary intervention trials of new remedies to prevent or to treat cardiovascular disorders, such as heart attacks or strokes, exemplify this type of work. Second, the detection of rare but serious side-effects of medicines requires the collection of information from several million patients recording all adverse medical events from hospital and general practice. Both types of research—the intervention trials and the surveillance studies—represent major investments of resources (patients, doctors), of facilities (data collection, computer analysis), and of time. The National Health Service provides a ready-made infrastructure for identifying and tracking patients, for checking treatments and for detecting medical events (new disorders, recurrences, adverse events,

causes of death). The research is basically an epidemiological approach and British expertise in this field is widely acknowledged. The provision of record-linkage between hospital and general practice would facilitate intervention and surveillance studies. Such an investment would provide a basis for research that can otherwise not be performed by existing institutions (universities or hospitals) or others (pharmaceutical companies, regulatory authorities).

Large-scale clinical trials

The primary and secondary intervention trials usually address two questions; first, whether a particular remedy has a therapeutic benefit compared with other remedies or means of management (for example surgical) and second, assessing the cost-benefit-risk ratios. The latter are clearly important in terms of provision of health-care to society. Therefore, the National Health Service should have a two-fold interest in this type of work; finding out whether a particular treatment is effective and assessing its relative cost against the benefits achieved. Responsibility for these large-scale trials should not reside within a pharmaceutical company and, indeed, the scale of the study and its nature really militates against a company undertaking it. It demands special resources and particularly the full utilization of the National Health Service structure to run such trials. Some trials have been run by other bodies, such as the Medical Research Council in the United Kingdom, and other collaborative arrangements have been made overseas, particularly in the United States, but must attempt to duplicate operational facilities already available in the National Health Service (patient, doctor, prescription identification and computerization).

The funding of these large-scale trials could be supported by the Department of Health and Social Security but contributions from the pharmaceutical industry can be expected. In these circumstances, the conduct of these large-scale trials might reasonably be assigned to a specially-constituted clinical research facility, which ideally could become an institute at a national level, possibly based within a university campus. It would require a level of independence, but provide a consultative framework and have sufficient authority and access to National Health Service systems to allow it to plan and supervise such studies.

Surveillance programmes

Rare adverse reactions to drugs (1:10,000 or more) can only be detected when a large number of patients have been exposed to it. At present there are two ways in which they are detected within the United Kingdom. First, notifications ("yellow-cards") from health-care professionals to the Committee on the Safety of Medicines and to the manufacturer may create a hypothesis. One cannot be sure whether it is a drug-related event or one associated with the disease or disorder being treated. Second, the Prescription Event Monitoring (PEM) scheme conducted by the University of Southampton can provide a prevalence figure: the number of patients surveyed is known and the number of suspected adverse reactions is identified. Neither scheme can separate drug-related from disease-related adverse events nor can they compare the risk from one drug with another. Once there is some suspicion about the safety of a medicinal product it is important that this can be resolved quickly. Therefore, it has been proposed by many experts that a record-linkage scheme should be established in the United Kingdom utilizing the framework of the National Health Service which will prospectively record adverse medical events in a large population of patients and at the same time identify all the medicines prescribed for them. In this way it will be possible to examine the prevalence of a suspected adverse drug reaction with one drug treatment and with other chosen drugs. More importantly, the data base would be already established and any hypothesis could be tested rapidly.

It would be preferable to utilize a research institute to undertake this work, which would be independent of the pharmaceutical industry and would have a measure of independence from the Committee on the Safety of Medicines. It could undertake surveys on their behalf but provide an independent expert opinion to both the Committee on the Safety of Medicines and the pharmaceutical companies concerned. This institute could be identical to the one charged to conduct large-scale clinical trials.

Conclusion

These proposals are probably different from those being received from individual pharmaceutical companies or from the Association of the British Pharmaceutical Industry, which will undoubtedly address the contributions of the pharmaceutical industry to medical and scientific research and the development of new drugs.

The two issues mentioned in this submission are ones of importance directly affecting the provision of health care to the nation. Both address the problem of the benefits and risks of medicines, especially those designed to deal with the major medical disorders that cause considerable morbidity and mortality.

May 1987

Memorandum by the British College of Optometrists

1. There are at present 6,618 optometrists (ophthalmic opticians) registered with the General Optical Council. The major services which the profession currently provides to the public include:

(i) The identification of defects of sight and the provision of properly prescribed and dispensed spectacles and contact lenses to remedy those defects, so that patients may enjoy the best possible vision with the greatest possible comfort;

(ii) The observation, in the course of carrying out the regular eye-examination (or "sight test") of signs of disease or abnormality in the eye; where such signs are observed patients are referred for medical investigation and treatment where necessary;

(iii) The provision of advice and treatment for conditions affecting binocular vision, either through corrective lenses, or through various forms of vision training;

(iv) The provision of advice and appliances to help people with low vision;

(v) The provision of advice on matters relating to visual needs at work and in recreation.

The above functions are carried out by optometrists both in general practice (in which the great majority are employed, or self-employed), and, perhaps at a more sophisticated level, in the Hospital Eye Service. Within the hospitals, optometrists often work directly with and in support of the medical profession in advanced diagnosis and in other specialised areas.

2. As the field of optometric professional activity has developed to meet public needs, so the scope and quality of optometric education and training has had always to be several steps ahead of practice, which has been possible as a result of the research already done. The profession is now ready to expand its services further, as the College has explained in its evidence to the Ministers on Primary Health Care, a copy of which is enclosed for the information of the Sub-Committee [*not printed*]. This submission of evidence also refers to the nature and efficacy of the profession's diagnostic and referral service.

3. The progress in developing its service to the public which the profession has already made has been due in great part to the advances made through research in optometry, medicine and related fields. The College believes firmly that it is only through the maintenance of an adequate and on-going programme of research and technological development that the profession can improve and expand its services to the public still further.

4. The College is, itself, therefore, active directly in the promotion of research through the provision of such funds as it can afford, and indirectly in the direction of research through the allocation of its support funds. Since its establishment in March 1980 the College has disbursed a total of £118,784 in support of research, at a steadily increasing annual rate. One scholarship to support full time research was made in the first year of the College's existence: the College is currently supporting seven full time research workers.

5. Optometric research is not carried out by the College itself but in the University Departments of Optometry and in other institutions. The Departments are:

Aston University
Department of Vision Sciences
Aston Triangle, Birmingham B4 7ET

The University of Bradford
School of Studies in Optometry
Bradford BD7 1DP

The City University
Department of Optometry and Visual Science
311-321 Goswell Road
London EC1V 7DD

The Glasgow College of Technology
Department of Ophthalmic Optics
Cowcaddens Road
Glasgow G4 0BA

The University of Manchester
Institute of Science and Technology
Department of Ophthalmic Optics
Sackville Street
Manchester M60 1QD

The University of Wales
Institute of Science and Technology
Department of Optometry
Colum Drive
Cardiff CF1 3EU

6. The nature and scope of recent research carried out in the Departments is summarised in the various Editions of "Current Research in Britain, Biological Sciences". It may also be of interest to the Sub-Committee to see the enclosed survey of optometric research prepared by Dr Neil Charman of UMIST in 1983, marked "B" [*not printed*].

7. The evidence of the College on your specific questions is as follows:

(a) Priorities in optometric research are not established in any formal way. The direction of research tends to be influenced by the availability of funds for particular projects, and by factors relative to the needs of the various areas of optometric practice; for example,

(i) In general practice optometrists provide a primary referral agency, particularly with regard to diagnosis, patient care (for example children's vision) and effective monitoring. The more effectively they can perform this function, the earlier will medical conditions requiring treatment be detected; this can improve chances of effective treatment in some conditions, and, in turn, benefit the patients and save consultants' time—and all in an economical way. There is thus a pressure to direct research towards the production of better methods of primary diagnosis;

(ii) Also, with regard to general practice, public demand for certain forms of clinical care can influence the direction of research; this is so in the case of contact lenses where a growing public interest is resulting in significant advances in research and technological development;

(iii) With regard to hospital optometry, research tends to be directed to meet the needs of medicine and surgery; hospital optometrists may be seen as Health Service Scientists and their work requires research both into better methods of correcting the visual problems of special cases, for example following surgery to the eye, and into more sophisticated diagnostic and operative techniques to be used in support of medicine and surgery.

(b) In view of the comments in (a) and of its belief in the importance of the primary health care service which optometrists can provide, the College is of the opinion that a stronger emphasis should be placed upon research into better methods of diagnosis at the primary referral stage.

(c) Accepting that at present there could be better ways of establishing priorities in optometric research, the College believes that the various factors, suggested in Mr Slater's letter dated 3 March 1987, are having an appropriate effect on priorities in research.

(d) The commercial funding of optometric research is usually related to a particular product. Public funding tends to cover areas of research which have no special or immediate commercial benefit. Charitable funding, for example by the College, is more widely based, and can be directed by the institutions concerned according to their perceptions of the profession's and the public's needs.

(e) The results of optometric research are disseminated in the United Kingdom chiefly through the College's journal "Ophthalmic and Physiological Optics" although other optical journals may also carry "unrefereed" papers. The College accepts that while these channels may be adequate in purely academic terms, they may not be so in relation to the need to bring the results of research effectively to the notice of optometrists in general practice. The College and other optometric organisations are actively examining ways of remedying this short-coming.

(f) The College believes that some duplication of effort in research may actually be desirable since it can lead to the better assimilation and evaluation of results. Unnecessary duplication, however, is wasteful, but, so far as optometry—which is a small profession—is concerned, it can usually be avoided through the continuous, informal communication that exists within academic optometry.

(g) The results of optometric research are, in the College's view, well reflected in the improvements in patient care that have taken place over the past 15-20 years, particularly with regard to diagnosis and referral. The speed with which the results of research reach general practice is, however, in part often restricted by the limited view which the public has of those of its needs which optometrists can actually meet. Were the public to become better educated in this respect, it might be expected that public pressure would develop to hasten the process.

In another respect, the reaction of practice to the results of research may also be slowed down by the fact that by no means all practitioners are able or willing to undertake continuing education on a regular basis.

(h) The College is by no means sure that changes in the priorities in the training of researchers in the optometric field are necessary. It acknowledges, however, that it has no good evidence on this subject. It believes that it would in any event be beneficial in this and in other matters related to optometric research if there could be some centralised machinery within the profession to coordinate the thinking and the efforts of the various research bodies concerned. The College may, indeed, itself be the right body to initiate the establishment of such machinery.

(i) The College recognises that the funding of optometric research may be a little haphazard, and it believes that this too is a matter in which a centralised coordinating body could be effective.

April 1987

Memorandum by the British Dental Association, Central Committee for University Dental Teachers and Research Workers

General Statement

The Central Committee for University Dental Teachers and Research Workers ("the Committee") is an autonomous committee of the British Dental Association (BDA) composed of persons of non-professorial status elected within dental schools, and professorial representatives elected by national ballot. There is cross-representation with other autonomous committees within the BDA and also with the Medical Academic Staff Committee (MASC) of the British Medical Association (BMA) with whom we work in close collaboration. The Committee has actively promoted all aspects of dental education and research in discussions with Government, the National Health Service and the universities and it welcomes the opportunity to present its views on dental research to Sub-Committee II which is considering priorities in medical research.

Impressive gains in oral health have been a direct result of accelerated efforts in biomedical research. These are threatened, however, by the considerable cuts in university funding since 1981.

While calling for an average reduction of 10 per cent in grant allocations, the University Grants Committee (UGC) in 1981 based its grant allocation on a less-than-average cut in the resources available to dentistry, partly because of concern at the low level of research activity. In 1982 the Committee inspected plans for cuts in each school and found that the UGC's intention to protect dental resources was largely being ignored. The Committee's estimates of 15 per cent cuts were corroborated by other organisations which had conducted independent surveys. Another survey, undertaken by the Committee in 1983, reached similar conclusions and in 1985 the Committee carried out further research. While the results suggested some protection for dentistry, five of the eleven provincial dental schools had experienced about the average cut for the university system as a whole and a few had received an even larger cut. In other words, nearly half of the dental schools had not received the protection intended. We suspect that others were so poorly financed before 1981 that there was no scope for further pruning. Last year the UGC again announced grant allocations based on no cutbacks for dentistry and we hope that this time universities will comply. Many different bodies identify the enhancement of dental research as a crucial need.

The higher costs of clinical academic staff and their greater mobility have caused proportionately higher numbers to be lost from clinical disciplines than from other university faculties. The loss of staff has resulted in an increased clinical burden on the remaining staff and has encroached both on teaching and even more heavily on research. According to the Committee's 1983 survey about the effects of reduced UGC funding (in which 14 schools participated) research projects solely dependent upon UGC finance appeared to have been the most affected and the outcome was to curtail research work rather than medicine in finding replacement funds from elsewhere. A substantial majority of the respondents did not feel that dental schools had the necessary infrastructure to support research. A high percentage (82 per cent) felt that the time available for research projects had decreased. The survey concluded that the cuts had resulted in less research activity and an increased teaching load on the remaining staff. An independent survey published by the University Hospitals Association in 1985[1] recorded that "The most consistent comment from Deans has been about the adverse effects of cuts in staffing on research. This has affected opportunities for clinical research most severely and is related largely to the increased teaching commitments of academic staff together with the loss of technical staff posts. Lack of money for consumables and equipment would also seem to be a factor". Moreover, the largest cutbacks have been made to pre-clinical departments where much fundamental research is initiated. Our survey of the effects of reduced UGC funding on teaching and research in basic science departments, which compared the academic year 1983–4 with 1980–81, revealed a reduction in UGC-funded research in 14 of the 15 schools covered. Over the period a reduction was recorded of 16 per cent in teachers in post but this average obscured a variation from school to school, including an increase of 50 per cent in one department at Guy's, following the merger with Royal Dental Hospital, to a reduction of 70 per cent in anatomy teachers at Dundee. A few schools

[1] University Hospitals Association and the National Association of Health Authorities: *Joint Survey on the Effects of Reduced Funding of Universities on Dental Schools and the NHS in England and Wales for the Academic Years 1983–1984 including Reference to the Academic Years 1981–1983.*

reported that significant research could be undertaken only if "soft money" could be obtained. Several personal, financial disincentives discourage clinicians from considering an academic career. The one incentive left to recruitment to academic units—the possibility of research time—has been severely constrained by service pressures.

A very high proportion of staff time is occupied by teaching. Like medicine, the course content and examination standard of necessity are set and monitored by a body outside the jurisdiction of the universities. However, unlike their medical counterparts, dental students must, by law, be competent to undertake independent practice on graduation. Dental students carry out many surgical operations directly on NHS patients. Considerations of patient safety alone demand that the high staff/student ratio be maintained in clinical dental teaching. Faced with cuts in staffing levels there is no possibility of reducing activities in these areas. Clinical academic staff are also responsible for postgraduate and higher training in all the specialist disciplines within dentistry. The treatment of patients is a further major commitment and in a number of specialist areas where treatment is available only in dental schools where it is the responsibility of clinical academic staff. For example, there may be no NHS consultants outside a school in such fields as dental pathology, microbiology and dental radiology.

The pressing need to undertake further research competes with these considerable demands and inevitably has had to suffer. Research is required not only into the problems of dental decay and periodontal (gum) disease, where results have already been successfully applied, but also increasingly into the numerous mucosal diseases which affect the mouth—the most serious of which is oral cancer. Many opportunities could be exploited more fully including epidemiology, immunology, pathology, biochemistry, microbiology, biominerals and cell biology. With the changing pattern of dental disease, particularly the falling rate of caries prevalence, the time is ripe to establish new piorities and reshape dental research. Since the Secretary of State's response[2] to Dental Strategy Review Group's Report[3] it has been Government policy that dental education ought to be modernised to equip the practitioner of the future. Consequently research is required in this area. However it is clearly more difficult to achieve our objectives for research under conditions of economic stringency.

The financial crisis has stimulated interest in seeking ways of producing optimal results with the limited and diminishing resources that are available. For example, one of the approaches recommended in the recent Butterfield Report[4] is the encouragement of collaborative research with other scientists to improve the exchange of ideas, take advantage of new techniques and share capital investment. However the Report confirmed that time for academic staff to undertake research is being taken up by other responsibilities. With few exceptions, the time available for research by clinical academic staff is rarely greater than 10 hours per week and is often much less than that. The Dental Committee set up jointly by the Medical Research Council, DHSS, Scottish Home and Health Department and the Science and Engineering Research Council[5] wishes to see all forms of support for dental research increased. It is regrettable that grant levels from the funding bodies are sometimes inadequate to recruit young scientists of high calibre to dental research in preference to industry. For those who choose academic dentistry as a career, declining promotion prospects to a dwindling number of Chairs depress morale and motivation. Some schools have experienced difficulties in recruiting and retaining staff in competition with universities abroad.

RESPONSES TO INDIVIDUAL QUESTIONS

(a) Dental schools' research priorities are dictated by the need to utilise a small workforce to meet the greatest areas of ignorance. Individuals' strengths determine research efforts in different schools and there is also recognition of the advantage of allowing research to be driven by original and creative thought based on critical appraisal of current knowledge.

(b) The resources allocated to dental research are so limited that it is impossible to cut back on any aspect. It is essential that first-rate research programmes are funded, particularly those providing training in research. Most areas of research require teams of people working together with the appropriate infrastructure.

(c) Dental research is constantly at the forefront of changing needs and developments in oral biology and pathology.

(d) Generally research councils award grants on the scientific merit of the application. With the limitation of funding, researchers are turning to industry. However industry requires applied research usually on short-term contracts and this type of endeavour is being conducted at the expense of the necessary fundamental work. Also talented research workers are spending inordinate amounts of time trying to raise funding and this activity is now a distraction from creative research rather than a stimulus.

[2]Secretary of State's response to the report of the Dental Strategy Review Group—speech to BDA luncheon (27.10.82).
[3]Department of Health and Social Security: *Towards Better Dental Health: Guidlines for the Future, a Report by the Dental Strategy Review Group (1981).*
[4]Report of the Work of the Independent Committee on Dental Research set up by the Robens Appeal (Chairman: Professor Sir John Butterfield) and the Conclusions of the Committee (1986).
[5]Statement by the Joint MRC/DHSS/SHHD/SERC Dental Committee—*British Dental Journal Vol 160 Number 8.*

(e) Research results, particularly those relating to basic research, now take too long to be recognised. Reading scientific journals suffers when increasing teaching and clinical loads are undertaken by academic and research workers. Also attendance at conferences becomes less easy for academics and researchers burdened with other duties. New methodologies for dissemination of knowledge uncovered by research are required.

(f) Unnecessary duplication can be reduced by effective communication between funding agencies. The Joint Research Committee of the Medical Research Council, the Science and Engineering Research Council, the Department of Health and Social Security and the Scottish Home and Health Department effectively does this in dental research. Dental schools and other organisations undertaking dental research should set up significant programmes of research in specific areas and publicise these widely within the research community so that duplication is avoided and support found where available.

(g) The time lapse between research discoveries and their clinical application is too long. This may be the result of lack of communication between research workers and clinicians, but there is no meaningful national machinery to conduct and control well-funded randomised clinical trials.

(h) Better facilities are required for training dental research workers, both clinical and basic scientific. Better career prospects are necessary and there must be careful consideration of clinical experience necessary for clinical research trainees so that this does not swamp their research training.

(i) The Research Councils should be allocated more funds specifically for training in dental research. Research efforts should be concentrated and not duplicated or conducted inefficiently due to lack of equipment, infrastructure and personnel. Funds should be made available for all highly rated grant applications and the current peer review system probably provides the best judgement on the quality of work proposed.

Memorandum by the British Diabetic Association

Introduction

The British Diabetic Association (BDA) is a charity established in 1934 to promote the welfare of diabetics in the widest sense. The Research Fund provides financial resources for research into the causes, prevention and treatment of diabetes and its complications, and the welfare of diabetics. Research in progress ranges from essentially fundamental scientific and molecular biological projects to purely clinical studies, such as evaluations of potential new treatments or diets for diabetics. The BDA's total research budget is £1.2 million in 1987. The Association does not conduct any "in house" research, nor maintain its own laboratories. Support is provided to research workers mainly in Medical Schools and Hospitals in the following main categories.

1. *Group Grants* provide 5 years' flexible support, usually to research workers with established international reputations. There are at present 10 such groups funded at £30k per annum.

2. *Project Grants* provide support to established workers for research staff and consumable expenses, normally for periods of 1–3 years. There are 54 such grants at present.

3. *Research Fellowships* provide two years' personal support for young scientists who intend to make their careers in diabetes research. There are 4 such awards.

4. *Research Studentships* are intended to attract the best young graduates into diabetes research. Two studentships are awarded each year, each for a period of 3 years to allow completion of a PhD degree.

5. *Senior Fellowships* are intended to allow senior research workers to work full time in diabetes research unhindered by clinical or teaching responsibilities. There are three such Fellowships at present.

The Association has recently conducted a survey of the overall funding of diabetes research in the UK, and the economic costs of diabetes to the Health Services, and copies are enclosed for the Committee's information. The main conclusion of this survey was that research into diabetes in the UK, which has an excellent past record of success, was severely underfunded at present.

Specific questions

(a) The MRC to some extent sets priorities by the establishment of Research Units which provide substantial research into specific areas over long periods. These Units are normally established around a medical scientist of international standing, and provide an effective means of promoting research. However, the deteriorating conditions for research in the UK means that a number of Units which the MRC had identified as working in important areas (for example MRC Trauma Unit) have closed because a suitable

Director cannot be found. The MRC and NIH have similar responsibilities for medical research in the UK and USA yet the NIH allocates over 120 times the funds to diabetes research.

In the Charity Sector the Wellcome Trust funds research over a wide range of medical problems, and does set priorities which they wish to see developed. Diabetes is not a current priority. Most other charities are "dedicated" to specific diseases and this means that the funds available reflect the public perception of the importance of the disease. Thus cancer research (through ICRF and CRC) spend some £50 million per annum together, and the British Heart Foundation some £15 million per annum.

(b) There is no case for cutting back on medical research, which is grossly underfunded by international standards. From the evidence of the paper "Funding of Diabetes Research in the UK", we would argue that, along with subjects such as mental health, diabetes is a rather "unfashionable" disease in terms of charitable donations, and that the resources devoted to it by the Government are unrealistically low in relationship to its economic (let alone its social) costs.

(c) Priorities are always evolving. Examples are the increased attention paid to gerontology, which remains a very unfashionable area, and the establishment of some studentships and training fellowships in recombinant DNA technology which the MRC sponsors and which allows scientists to become conversant with these modern techniques.

(d) Our recent analysis shows the extent of public, commercial and charitable funding of diabetes research. It may be that the Government's contribution is so low because of a mistaken perception of the nature and extent of funding which the charities (and especially the BDA) can provide. We are at present engaging in discussions with the MRC and the pharmaceutical industry about this; it is not yet clear whether any increases in funding can be achieved. The BDA has one major project in progress "The UK prospective study of Diabetes" which is funded jointly by the BDA and the MRC, with substantial contributions from the pharmaceutical industry.

(e) Yes. The existing mechanisms for dissemination of research information are extremely effective. This means that results published in scientific journals in the UK are available to research workers throughout the world in a matter of weeks, and vice versa. The BDA also holds biannual scientific meetings in the UK which allow scientists and clinicians involved in diabetes research to exchange ideas and information. At the recent meeting in March 1987 attended by some 700 doctors and scientists, over 190 scientific papers were presented.

(f) The BDA, along with almost all medical charities and Research Councils, has a Research Committee whose task is in part to prevent duplication of research effort. This is part of the normal procedures for allocation of priorities for research funding in all these organisations and it is not unusual for individuals to be members of research committees of two or more funding bodies. Duplication of effort is therefore not a major problem.

(g) Yes. For instance, in diabetes research the initial work on insulin infusion pumps for patients' use and the monitoring of HbA levels in blood as long-term indications of glucose concentrations were initially developed as basic research tools. These and many other examples have, and will have, direct application in patient care.

(h) and (i) The major problem is that of poor career prospects resulting from reductions of funding of Universities and Research Councils. The "traditional" career pathway for scientists committed to medical research—PhD, postdoctoral Fellowships, followed by University teaching posts, is now almost closed, and there are even fewer long-term prospects for clinically qualified researchers. Consequently, good students are reluctant to go into research, and those at present in research posts are leaving for other careers or emigrating because of lack of opportunities and uncertain funding. The seriousness of the present situation cannot be emphasised too strongly.

Professor S L Howell
Chairman of the British Diabetic Association Research Committee

April 1987

Letter from the British Digestive Foundation

I write on behalf of the British Digestive Foundation as their President. The Chairman of our Scientific Committee, Sir Douglas Black, is already replying in relation to other organisations. For this reason and because we are a relatively new and small organisation I will restrict my comments to three points.

First, the funding of the Medical foundations by the generous public is much more closely related to emotive forces than to medical need. Digestive diseases and disorders relate to about 10 per cent of all

the medical work of the country. Our share of the voluntary support for the Medical Research Charities is only.0.0014 per cent Cancer, Children, the Blind etc have of course a much bigger share. Like so many statistics, our share is misleading because gastroenterology will get research support from other foundations particularly the Wellcome and the Cancer organisations. Two per cent is probably a more accurate figure but even so this is relatively small. We have a challenge which we happily accept.

Secondly, the District General Hospitals have immense resources for clinically orientated research which tends not to attract MRC support. The locally organised Regional Board Research Fund is relatively small and the Medical Research Foundations have a most useful role in helping such work. This can make an important contribution towards better understanding of the natural history of diseases, and improved treatment including the reduction of unwanted side effects of many drugs. Often quite small amounts can make important contributions, for example, secretarial or statistical support for both single or multicentre trials.

Thirdly, the Foundations have a significant role to play in narrowing the ever present gap between knowledge and practice. Preparing information leaflets or booklets and supporting conferences enables new knowledge to benefit the public more quickly. Unfortunately some of the Medical Research Foundations think that this is outside their terms of reference. Personally I am sure the public would approve of such expenditure. Perhaps a recommendation could be made on this point.

Both Charity and Research are two words which are increasingly misinterpreted by the public and create distracting emotions. I believe they should be avoided whenever there is an appropriate alternative. Clinical investigation is one such alternative. Perhaps this point might be considered in the final drafting.

F Avery Jones, CBE MD FRCP

June 1987

Letter from the British Heart Foundation

In reply to your letter of 3 March 1987, I enclose a copy of "An Introduction to the British Heart Foundation", which describes in some detail our involvement in medical research.

Below are answers to your specific questions:

(a) The BHF is concerned only with diseases of the cardiovascular system and does direct research into specific areas of this field. While the "health needs of the nation" are not taken directly into account, the BHF's first concern is with the major cause of disability and death in this country.

(b) The BHF cannot comment on this.

(c) "

(d) The restriction of funding to other bodies has led to increased demands on the BHF, so that this is now the major source of funds for supporting research in the cardiovascular field (including industrial research). The demands are likely to become excessive in forthcoming years, unless other bodies increase their funding in this field.

(e) Yes.

(f) There is little communication between funding bodies at present in the cardiovascular field. Some liaison is desirable and attempts are being made by the BHF in this direction.

(g) The evidence suggests that the results of clinical trials are not reflected in clinical practice. This perhaps reflects, partly, doctors' attitude to the results of research, and partly the difficulties of implementation in the presence of limited resources.

(h) Many potential medical researchers are deterred by lack of career prospects, and this has been aggrevated by the reduction of posts in the Universities.

(i) In that cardiovascular disease is the greatest single cause of disability and death, substantial support for both basic applied research in this field should be guaranteed by other relevant funding bodies.

I hope the above facts and general detail of what the British Heart Foundation is doing will help your Committee. By the end of this year we will have paid out approximately £12 million towards Research, Equipment and Education, all from voluntary funds.

P G S Tower
Director General

March 1987

Memorandum from the British Institute of Radiology

INTRODUCTION

The British Institute of Radiology exists to bring together Scientists, Industrialists and Medical Practitioners with mutual interest in medical applications of radiations. Its principal activities are stimulating new initiatives and communicating and publishing results in research in the general field, which includes three interconnected areas of interest: imaging and other diagnostic procedures using the radiations, therapeutic procedures using the radiations, and considerations of the potential hazard to patients, staff and the general public from medical and other uses of the radiations. Within these three areas, interests and activities of our members extend across the spectrum of basic research, technological development, industrial exploitation, and clinical evaluation and research.

Responses to the specific questions are as follows:

(a) *Setting of Priorities*

Priorities for research in our field arise predominantly in response to the proposals of academic research groups.

Outside its own Units, we have the impression that Medical Research Council takes little specific initiative in these areas except occasionally in relation to radiation protection. However, recently, having identified Nuclear Magnetic Resonance (NMR) as a major call on its funds, it has attempted to rationalise its support in this area.

DHSS (Scientific and Technical Branch) seems to operate a policy of encouraging developments that will show eventual benefit within the NHS. Particular examples here are support that they have given to the development, in the 1970s, of x-ray computerised tomography (CT) and more recently to NMR. In both cases here there seems to have been a further element of wishing to provide support to specifically UK based industry.

Many of the individual initiatives on research may primarily reflect perceptions of scientific possibility rather than immediate health need (ie basic science rather than applied technology). However, past experience indicates that such basic research will often contribute eventually, perhaps in unforeseen ways, to health needs. Basic research in radiobiology and particular applications in radiotherapy is an example here.

An important point here is that the conduct and much of the practical benefit of basic research operates essentially on an international scale and, thus, impact on the "needs of the NHS" are difficult to quantify.

(b) *Balance between branches of research*

It would not be appropriate for us to comment on the relative priorities between research in our area and that in others. We would also note that this topic begs the question of the criteria for "rightness" of balance. However, within our own area, and if one uses a cost effectiveness criterion on the lines of quantifiable health impact (eg man years prolongation of life) per unit expenditure, we would have the impression:

1. That clinically directed expenditure (in diagnostic and therapeutic areas) is more cost effective than that concerned with radiation safety (which may of course have a valid political justification).

2. That money spent on big science may carry a prestige element and be relatively non cost effective. For example, MRC alone spent £899k on NMR imaging research in 1985/6, where cost effectiveness considerations might well have indicated a considerable shift in the balance towards, for example, ultrasound imaging.

3. There is a world-wide lack of objective knowledge as to the impact on health indices of particular advances in diagnostic and therapeutic medicine, and a reluctance on the part of many clinical researchers to expose themselves to the discipline of the prospective randomised trials that might provide some objective information in this direction.

(c) *Are priorities adapting?*

We believe that research and funding bodies are generally aware of changes in need and opportunity and that priorities are correspondingly changing. Particularly in relation to technological change our organisation provides a unique interface between medical and technological aspects of our field and from this point of view we believe that priorities are adapting effectively.

(d) *How are priorities influenced?*

The first part of this question has been addressed to some extent in section (a) above.

The balance between public, charitable and commercial funding is complex in our area. Charitable funding (and, to some extent public funding, influenced by political pressure) tends to support research areas (for example cancer) that are publicly perceived as being important, but without necessarily any clear knowledge that research will be cost effective. Commercial funding (which is becoming increasingly international in its basis) seems to be determined in its policy partly by straight requirement to obtain effective (and thus reasonably fast) return on investment, and also by a need of the big corporations to establish a strong position against competitors. Thus, again in the field of NMR imaging, the big companies have recently been investing very heavily in R&D substantially in order to ensure that their strategy of maintaining a full product line is maintained. Thus, a strong element of public funding needs to be maintained, preferably with some specific direction towards, firstly, supporting potentially cost effective areas in which commercial and charitable funding tend to be ineffective and, secondly ensuring a viable infrastructure of basic research as a foundation for more opportunist commercial and charitable funding to contribute to desirable objectives.

(e) *Are research results disseminated?*

Generally the procedures for dissemination of research results are satisfactory and effective. However, there is a tendency, which should be strongly resisted, for researchers with basic public or charitable funding to feel that supplementary support for commercial collaboration will inhibit their ability to disseminate research results. This may lead some researchers to avoid commercial collaboration and others to be unduly inhibited from publishing. Generally this is quite unnecessary if the collaboration is properly negotiated and it is important that professional advice on this score be adequately available.

(f) *Duplication of research effort*

Any research proposal subject to peer-group review will normally be looked at for possibilities of mere duplication, as will research papers submitted to refereed journals. It is an expectation on any professional researcher that he will be conversant with current literature and, generally, that he will participate sufficiently in international conferences to be aware of any substantial activities parallel to his own. The areas in which one does sometimes see appreciable duplication of effort are firstly in industrial research, when one has the opportunity to have privileged access to industrially secret research in several different companies, and also sometimes in Eastern block countries where secrecy is compounded with bad communications.

(g) *Does research lead to improved health care?*

Generally this is the case but the process is not always either efficient or prompt. Improvement is needed in the manner in which research ideas feed into commercial exploitation (as being the normal route to widespread availability of new techniques in health care). In our area and particularly in diagnostic techniques there has been a tragic failure of the flow of research ideas, through UK industry, to patient care. Public sector research in UK universities and hospitals has, over the past thirty years, made a quite disproportionate contribution in international terms to developments in the areas of ultrasound imaging, nuclear medicine, and NMR imaging and, although benefit has eventually reached the patient, this has been predominantly through foreign industry, apparently with major loss of opportunity for prosperity and employment in UK industry. We believe that UK academic and clinically oriented research in our field still maintains this high international standing and provides commercial opportunities that the national economy should not be ignoring.

(h) *Priorities in training medical researchers*

No comment.

(i) *Desirable changes in organisation or funding*

1. As indicated above, a substantial publicly supported research base must be maintained if effective use is to continue to be made of the opportunistic sources of funding available from charity and commerce.

2. British science in our field, although strong in many ways, tends to be unduly parochial in its funding arrangements. It would benefit if we were to follow the practice of major USA funding bodies and call more frequently for expert advice on funding decisions from overseas scientists of high standing.

October 1987

Letter from the British Laboratory Ware Association

Thank you for your letter of 3 March seeking information concerning priorities in medical research with particular reference to the needs of the NHS. I wrote a circular letter to our 170 member companies requesting such information; the paucity of response in itself is evidence of the amount of *MEDICAL* research undertaken by our member companies. Whilst there is no doubt that the equipment employed in medical research in many instances may have been manufactured or supplied by them, few of our members themselves undertake *MEDICAL* research.

Concerning your nine specific questions, this association is not in a position to comment on your sub paras b, c, d, e, f, h and i.

Concerning Q (a) In areas such as clinical chemistry, research is undertaken to exploit a perceived market opportunity or to increase the productivity of a current model such as, for example, equipment used for a diagnostic technique.

(g) Such research, if successful, normally is reflected in improved patient care as it can expedite diagnosis whilst improved productivity gives better value for NHS expenditure on such equipment.

R E Cox
Secretary General

April 1987

Memorandum by the British Leprosy Relief Association

Introduction

LEPRA—The British Leprosy Relief Association (formerly known as BELRA, The British Empire Leprosy Relief Association) was founded in 1924. The main objective of the Association is the eradication of leprosy, and financial and practical support is currently provided for:

1. Leprosy control/treatment programmes in countries where leprosy is found.
2. Leprosy research, including research in a variety of disciplines especially related to the development and field testing of an anti-leprosy vaccine.
3. Training of leprosy research and field workers.
4. Publication of the medical journal "Leprosy Review" and support for other health education activities.
5. Surgery for hands and eyes damaged by leprosy.

The Association relies on a Medical Advisory Board comprising of Clinicians and Scientists in the disciplines of immunology, pathology, microbiology, dermatology, epidemiology and ophthalmology for advice and recommendations as to what research or control and other projects should be supported. The Association receives applications from hospital and university departments in the UK for leprosy research grants and from a variety of sources overseas for research, treatment, training and other grants. All applications are considered by a Grants Sub-Committee of the main Medical Advisory Board, which seeks the assistance of outside referees where appropriate.

In the UK LEPRA supports research work at a number of centres and provides fellowships for doctors and research workers from leprosy endemic countries to obtain training in leprosy research. In order to encourage more doctors in the UK to take an interest in leprosy during their career, LEPRA provides grants to UK medical students, to undertake leprosy projects abroad during their elective period study and also runs an annual prize essay competition on leprosy for UK medical students.

Answers to specific questions

An attempt has been made to answer the specific questions raised only in so far as they relate to leprosy, since it is felt it would not be appropriate for LEPRA to comment on the questions in respect of other aspects of medical research in the UK.

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

LEPRA's priorities for support of medical research related to leprosy are reviewed from time to time by the Medical Advisory Board in the light of changing needs and developments in the leprosy field. Although there are a number of leprosy cases in UK receiving treatment, the disease is no longer endemic here and hence priorities in leprosy research are not set in accordance

with the needs of the National Health Service. However, results arising from research (for example the recent development of multiple-drug therapy) are of benefit in the current treatment of patients in the UK while efforts to produce an effective leprosy vaccine will, it is hoped, lead to the eventual eradication of the disease. Research carried out in the leprosy field is also particularly relevant to tuberculosis as well as to the immunology and bacteriology of other infectious diseases.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

It is felt it would not be appropriate for LEPRA to comment on this question except to note that following the recent MRC cutbacks, LEPRA was requested, and has agreed, to partially support a research programme at one UK university which did not receive renewal of its MRC grant.

(c) *Are priorities in medical research adapting to changing incidence of disease, changing population structures and new technology?*

Due to the flexible approach adopted by LEPRA it has been possible to adapt LEPRA's priorities in leprosy research to changing needs and new technology.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

LEPRA's consideration of applications for support of leprosy research is influenced by the quality of the institution applying.

(e) *Are the results of research adequately disseminated?*

Results of leprosy research are adequately disseminated in journals such as "Leprosy Review" which is published by LEPRA, "The International Journal of Leprosy" and other journals. Results are also disseminated at both national and international leprosy meetings for which LEPRA frequently provides support.

(f) *How is unnecessary duplication of research effort avoided?*

All LEPRA grant recipients are required to submit annual reports of their LEPRA supported research work for assessment by the Grants Sub-Committee (GSC). Members of the GSC are aware of leprosy research being currently undertaken in different areas of the world and therefore unnecessary duplication of research effort can be avoided by LEPRA. Coordination of leprosy research projects supported by ILEP members is also carried out by the ILEP Coordinating Bureau which publishes an annual directory of research projects being undertaken or supported by member associations (LEPRA is one of the members of ILEP—the International Federation of Anti-Leprosy Associations). The International Leprosy Association also plays a part, in particular in the organisation of the International Leprosy Congresses which are held every 4–5 years, at which research results are presented.

(g) *Is research reflected as it should be in actual improvements in patient care or health education?*

As mentioned under (a), research work has led to the introduction of multi-drug therapy for leprosy which is a significant improvement for patient treatment. Research into the nature and transmission of the disease has also enabled information health education campaigns to be conducted in leprosy endemic countries, thereby increasing case detection of the disease through self-reporting.

(h) *What changes in priorities in the training of medical researchers are needed?*

Priorities for LEPRA's support for the training of medical researchers in the leprosy field are reviewed from time to time by the Medical Advisory Board in the light of changing needs of leprosy research.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

This question, as it relates to leprosy research, is considered by the Medical Advisory Board when it reviews LEPRA's priorities for medical research from time to time.

Letter from the British Lung Foundation

I write to bring to your attention the depressed state of respiratory research in the UK, resulting from an acute shortage of funds, and the progressively more serious consequences this is having for the practice of respiratory medicine in the National Health Service, both in the short term and in the long term.

The British Lung Foundation is a relatively new national charity, set up by respiratory specialists from all over the UK in 1984 to raise money for respiratory research. They recognised the appalling lack of funds in this specialty and the British Lung Foundation was established to raise money to help remedy this deficit. The Foundation raises funds by direct appeals to industry, and the public at large. To date it has raised over £500,000 and has given out grants varying from a few thousand pounds to £50,000 (over three years) for research projects. Although this is a considerable achievement we are aware that it is only a tiny contribution towards the problem of funding respiratory research adequately in this country.

We would like to present the argument for a greater share of the resources available to be devoted to research into respiratory disease. (See figure attached.) It appears that less than £1 million was spent on respiratory research by members of the Association Medical Research Charities in 1984, out of total research support of almost £90 million by those charities. The Medical Research Council's latest report shows that less than 0.7 per cent of its expenditure classified as being on respiratory research, although it is accepted that there is relevant research work classified under other headings. Overall it seems reasonable and conservative to estimate that respiratory medicine as a specialty receives no more than a few per cent of the total funding for medical research in Britain. In addition pharmaceutical companies support drug-related projects, but here again these are small compared with other specialties.

The figures quoted above exclude amounts relating to lung cancer, although as an organisation we are very concerned with the major health problem it presents.

By contrast the need, in terms of the social and economic cost resulting from diseases of the chest and lungs, is a very high proportion of the total burden of disease. The Compendium of Health Statistics produced by the Office of Health Economics shows that for 1984 14 per cent of all deaths in the UK due to medical causes were caused by respiratory disease other than lung cancer (lung cancer caused a further 6 per cent of such deaths, giving 20 per cent in total). Respiratory disease other than lung cancer was responsible for 51 million days off work, 14 per cent of the total. In their study entitled "Priorities in Biomedical Research" D A K Black and J D Pole calculated indices of burden to establish to which areas in medicine priority should be given in research. Respiratory disease accounted for the second highest level of burden, after mental illness and handicap, with an index more than double that of the third highest category (ischaemic heart disease). It was ranked first in GP consultations and days of sickness benefit, third in mortality and outpatient referrals, and fifth in terms of in-patient days, where its lower rank could be affected by bed availability.

Although we did not receive an invitation to submit our views to the Committee, in this context we would like to offer our views on the specific questions to which the Sub-Committee will be addressing itself. Our proposed answers to the nine questions are given below:

(a) At present priorities in the public sector appear to be set largely by the availability of existing facilities and the particular interests of currently active research teams. In the voluntary sector, funding for research is affected by the success of the appeals made by individual charities. This depends on the general public's perception of health needs, which in turn is affected by the voluntary sector's presentation of those needs.

The requirements for the National Health Service should reflect an objective assessment of the contribution of individual groups of disorders to the total burden of ill-health. Black and Pole attempted to provide such an assessment for setting research priorities. It is equally valid for other aspects of the National Health Service.

The present situation will tend to preserve and strengthen the existing pattern of allocation of research resources, except where it is affected by a new factor with high public profile, such as AIDS.

(b) In terms of the allocation between basic medical research and clinical research, we have no comment. However, there may be a need for more attention to be paid to research into the application of new discoveries, particularly across the conventional boundaries of medical specialisation.

As regards the balance between different areas of medicine, our view is necessarily that at present it is not correct and that research into respiratory medicine is under-funded and should have higher priority than at present. We would not wish to comment on which programmes might be cut back, except to say that the choice should take into account the likelihood of success and the size of the resulting benefit of health, if success is achieved.

If increased resources become available, we consider that two aspects of medical research should have special consideration:

(i) the provision of longer-term posts for senior research investigators, to encourage the best medical workers to enter on and continue with a career in medical research;

(ii) the provision of specialised new posts to encourage growth in areas such as respiratory medicine where there has been an undesirable decline in the quantity of research work

due to lack of funding. There is no lack of able personnel and exciting ideas and avenues for research.

(c) For reasons outlined under (a) response to change is usually slow. Funding tends to be reactive in response to demand by doctors and research workers. They are most interested in pursuing their own avenues even if benefit to society might lie elsewhere.

(d) To the extent that the allocation of public funds is not managed, that is, it is left to applicants to decide the institutions' priorities, charitable funding will always play a very important part in setting priorities. Their ability to do this is, however, limited by the funds they receive, which in turn depend on the general public's perception of the cause each individual charity promotes. For both these sources of funding therefore the relation between research priorities and an objective valuation of need is not as strong as it should be. We have not examined commercial funding in any detail, but since the size of potential commercial markets is related to needs, one would expect the setting of priorities in this sector to relate to commercial benefit which is not always the same as community benefit.

(e) The results of research are usually available promptly, through professional journals, conferences, seminars, etc. However, keeping up to date is an important and time-consuming task in any area of the profession. Research workers must have time available for this. The problems of educating general practitioners in the application of new developments need more attention. This will be especially true of areas, like respiratory medicine, which do not enjoy the highest level of attention at present.

(f) This relies in the first instance on the heads of departments in institutions where research is carried out being able to keep themselves adequately informed of research developments world-wide. It also depends on the knowledge available to the committees that control the awarding of research funds. This is not overall a major problem and some duplication of research is not always undesirable.

(g) Yes. The practice of modern medicine is based on research, largely carried out in the last 50 years. Research is the lifeblood of medical advance.

(h) A clear career structure. More emphasis on specific training rather than solely learning in practice.

(i) We consider that two specific changes are needed:

  (i) a change in the allocation of public funds to research workers outside government research establishments, to take greater account of medical needs of the community, and

  (ii) a reexamination of the career structure and funding of such research workers, particularly those involved in clinical medicine, to provide a guarantee of longer-term career prospects.

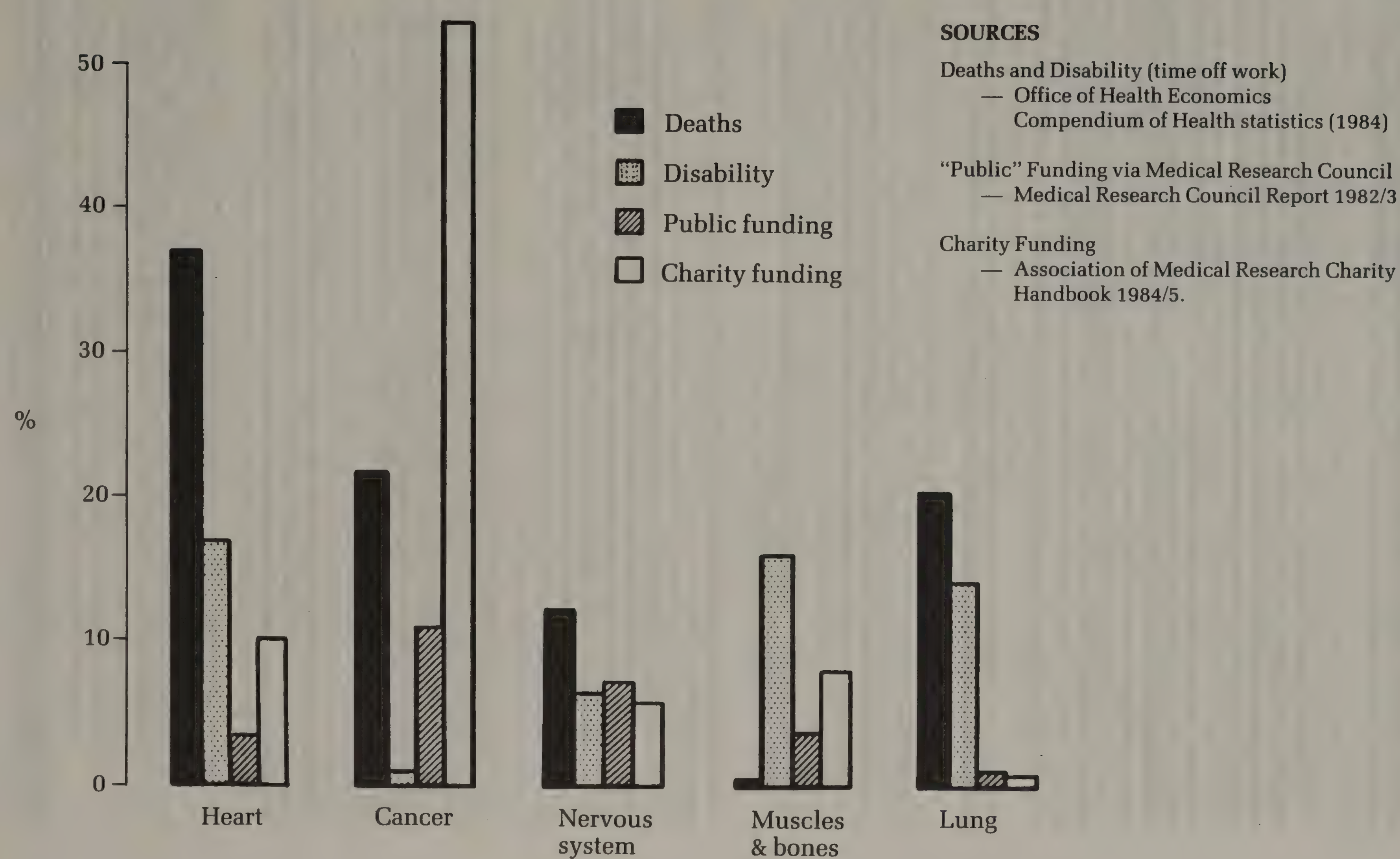
We notice that government support for the Medical Research Council is falling in real terms. We believe strongly that this trend should be reversed, enabling the MRC to expand its commitment to under-funded research areas such as respiratory medicine. Alternatively, or in addition, if central government is unwilling to continue and expand its support of medical research in Britain, further VAT and other fiscal concessions could be made available to the medical research charities to enable them to do so.

I hope that our submission will not be too late for your committee to take it into account in its enquiry into "Priorities in Medical Research". I would be glad to provide any further information on our views that you may require.

Malcolm Green, DM, FRCP
Chairman

May 1987

Death, Disability and Funding by cause



Memorandum by the British Medical Association, Medical Academic Staff Committee

The Medical Academic Staff Committee (MASC) of the British Medical Association considers and acts upon all matters of concern to medically qualified full-time personnel holding contracts of employment from universities, medical schools, the Medical Research Council and other institutions engaged in medical research.

The financial pressures imposed on the universities over the past five years have resulted in an overall reduction in the number of clinical academic staff which now seriously jeopardizes the role and function of the university medical schools. Clinical academic staff have commitments not only to teaching and research, as have other university teachers, but also to provide NHS patient services as a continuing 24-hour responsibility. Surveys[1] have shown that as clinical academic staff devote more of their time to NHS work, because of the cutbacks in staffing, less of their time can be devoted to teaching and research. Although clinical academic staff are the main producers of original clinical research, a decreasing amount of its funding has come from the University Grant Committee's recurrent grant, but rather from the Medical Research Council (MRC) and medical charities. This dual support system has been under increasing strain, because university funds may no longer be adequate to provide "well found" laboratories (both technologically and in staffing) suitable for research. MRC funds have also been cut in real terms and the number of alpha rated projects for which funds are available has decreased. Clinical academic staff, therefore, are having to spend more time trying to obtain research grants from alternative sources.

Funding for clinical research programmes is derived from a number of sources, but is inadequate to achieve the correct balance between health services, clinical research and basic science.

— the MRC is heavily oversubscribed for alpha rated projects, for both basic science and clinical research;

— the Regional Research Committees of the Regional Health Authorities are oversubscribed for projects which they would like to fund and which are usually practical and patient related or which provide priming money for existing projects;

— the Department of Health and Social Security (DHSS) gives small grants for health services research which are entirely patient orientated.

The MASC has highlighted aspects of the nine specific questions on which the Sub-Committee has requested evidence.

(a) There is a distinction between university-funded research and public sector research. University staff can follow their own clinical initiatives, although there may be common interests. The Medical Research Council selects brilliant individuals who can undertake research into particular problems which respond to the nation's needs. Examples of this are the Pneumoconiosis Unit (now closed), the Clinical Oncology and Radiotherapeutics Unit and the Environmental Epidemiology Unit.

There is also a distinction between basic research which is not necessarily goal orientated (for example molecular biology), and clinical research which is often the application of scientific method into areas of public concern. The charitable foundations' main contributions are in the highly publicised and emotive areas of coronary and cancer research. There is, in addition, a general failure to pursue research into so-called disreputable diseases (such as sexually transmitted diseases and diarrhoea) and low-profile diseases (for example kyphoscoliosis and mental health) which is mainly undertaken in universities, both as basic and clinical research.

Priorities are set to the extent that funding is given to support brilliant and gifted individuals and the major strides in research have been from such "free thinkers". However, particular subjects can be identified for support and gifted individuals undertaking research in that subject would be given priority, for example the recent grant given to research into AIDS directed by the MRC.

(b) There is an imbalance at present between the different branches of research. For example, over half of the medical charities' spending on research is in cancer and heart disease. The public sector is underfunded in both basic research and clinical research. In the present financial climate, short term projects with easily obtainable results may be favoured, whereas long term basic research may be neglected. There are no programmes which are so unproductive as to be curtailed. Programmes which need higher priority are the application of molecular and cell biology in the study of human diseases; the nature of cancer and the possible involvement of

[1]British Medical Association Surveys on Medical School/Faculty Funding and Staff Losses, 1986, and University Hospitals Association Survey into Academic Medical Staffing Changes, 1985.

infective agents; anti-viral drugs and vaccines; gene therapy; blood vessel disease; mental illness; behavioural diseases such as smoking, drink, drug and diet.

Priorities would not necessarily change in the light of increased resources, but it would be possible to undertake more research. Human resources must also be nourished and at present they are decreasing because of the policy on funding and pay.

(c) Priorities in medical research often change depending on the incidence of diseases in the community, for example, in relation to parasitic and tuberculosis incidence in ethnic minorities, nutritional disorders, and an ageing population.

(d) Priorities in medical research are influenced totally by the institution through which research is funded, but their priorities may not necessarily be the same.

— public sector research (MRC and universities) is concerned with scientific excellence;

— the charitable foundations are also concerned with scientific excellence but usually within a specifically targeted area of research;

— the commercial drug and other companies target their own areas of research and impose other restrictions on funding and publication.

(e) Results of research are adequately disseminated through scientific and specialist journals and more informally through the camaraderie of scientists.

(f) Some duplication of research effort is necessary and there are advantages in the confirmation of results.

(g) Benefits which require no additional resources can be implemented immediately. Changes in health care may also be introduced immediately, for example, the widespread use of penicillin. However, there may be more gradual changes with technological advances and the application of new techniques. Research into health education has not been as effective as it should be, for example smoking being directly related to lung cancer. Behavioural aspects are important but may be affected on the one side by doctor/patient communication, and on the other by commercial pressures. The advantages of implementing health policies are outstripping the resources available, because of the increasing expense of diagnostic techniques.

(h) Recognition for higher training by the Royal College does not often encourage medical research because experience in research is not a requirement. Time is not available within the present training period for further training in basic science which is essential for medical research although some recognition may be given for clinical research. The career structure needs to be more flexible to allow junior medical staff to re-enter the mainstream National Health Service without penalty and be credited for the years they have been undertaking research. The consultative document "Hospital Medical Staffing—Achieving a Balance"[2] has failed to recognise the importance of training for clinical research and much greater thought must be given to the availability of time and appropriate clinical contracts for those who wish or need to pursue research programmes. A DHSS working party is, however, currently considering this problem.

(i) With the present cut in university funding universities have become too preoccupied with fiscal control and undergraduate courses to allow clinical academic staff to pursue individual lines of research. There may be advantages in separating research from teaching which could lead to better organisation. This could ensure that research was focused in more particular ways rather than being so diverse. However, it would lead to stagnation in teaching which in universities has been involved in communicating new ideas to the next generation. This freedom to pursue individual lines of research in association with teaching is perceived as one of the advantages of working in a university environment. This is in contrast to the MRC which is more directed and controlled. It is desirable, therefore, to keep both systems, though with their constrained resources, the universities have to be more controlled and constructive. There may need to be some mechanism of research review committees for allocating basic funds, space and overheads.

The National Health Act 1946 gave the duty to teaching hospitals to provide the universities the facilities required for clinical teaching and research. With the restriction on funding of both teaching hospitals and universities, these facilities are increasingly restricted. In addition, the curtailment of MRC funds means that it is now unable to fund sufficient grants. The medical charities are too specialised in their fund allocations to fill in the gaps.

April 1987

[2]Hospital Medical Staffing—Achieving a Balance. A consultative document issued on behalf of the UK Health Departments, the Joint Consultants Committee and Chairmen of Regional Health Authorities, July 1986.

Letter from the British Society for Dental Research

I have consulted members of the management committee of the British Society for Dental Research. Regrettably, we concluded that we had too little time before April 30 to enable us to offer concerted opinions on the nine points you raised. I can, therefore, offer only the following opinions agreed between the Secretary, Dr D Adams, and myself. They relate to dental research only.

Question:

(a) Priorities may be set by funding bodies such as the Medical Research Council but they often change dramatically in response to contingencies such as the recently revealed seriousness of the AIDS "epidemic". In general, the priorities do meet the needs of the National Health Service and thereby, hopefully, the nation.

(b) There are very many branches of dental research and funding for each is probably apportioned fairly but not generously. Increased resources would not alter priorities but they would allow much needed *long-term* investigations to be carried out into dental caries and periodontal disease. Together these two diseases are second only to the common cold in being responsible for loss of time from work and school.

(c) Yes.

(d) Priorities in dental research are very much influenced by State funding bodies such as the Medical Research Council. The University Grants Committee tries to ensure that dental schools properly act as university departments with a strong commitment to research. It does not determine priorities. Burdensome though they may be to the national resources, dental diseases are not "killers". Therefore research does not attract much support from charitable institutions.

(e) Yes.

(f) There is not enough duplication of effort for its avoidance to be a problem. Where it rises it is highlighted by the rigid and critical refereeing system common to all grant awarding bodies.

(g) Yes, though many improvements in dental health care arise from technological advances rather than from improvements in the understanding of the disease process. This is at least partially due to under-funding of dental research.

(h) The main requirement in training is resources for dental graduates to acquire basic science qualifications and for clinical dental staff to receive training in research methods. This needs to be supported by a clearly defined career pathway for such severally qualified individuals to enable them to reap rewards similar to those who follow purely clinical careers. Career prospects for pure scientists in dental research also need improving.

(i) There is an arguable case for a body quite separate from the Medical Research Council to be responsible for the allocation of any Government funds for dental research. At the same time, it would be advisable that any such dental research committee should not be dominated by clinical dentists who are not currently active in research.

I hope that these somewhat personal opinions may be of some interest to your committee.

D F G Poole

April 1987

Research in Thoracic Medicine (Respiratory Disease)

The Society's involvement in research falls under two headings.

(a) Meetings of the Society at which research is presented and discussed.

(b) Research undertaken by the Society itself.

The Society (or its previous Societies under various names and constitutions) has, since the early 1950s, seen as one of its major responsibilities the furtherance of research in thoracic medicine and the involvement of its members in clinical research.

The *Research Committee* of the Society is composed predominantly of practising clinicians who are supported by statistical and other specialised advice. The Committee initiates and carries out research projects on a wide range of topics within thoracic medicine.

Suggestions for research come mainly from individual members of the Society, but also from other groups such as the Thoracic Medicine Committee of the Royal College of Physicians and the Joint Tuberculosis Committee (both of which contain representatives of the DHSS) and from the pharmaceutical industry.

Most of the work of the Research Committee has in the past been on clinical problems (methods of diagnosis, investigation and treatment of commoner conditions), but there is increasing recognition of the importance and relevance of epidemiological research and of operational research, both fields in which the Committee has already become involved.

Some examples of the range and type of research undertaken by the Committee are shown below.

(i) *Relatively uncommon conditions for which large numbers of patients are required for studies of treatment.*

— spontaneous pneumothorax
— hemotherapy of pulmonary tuberculosis
— chemotherapy of tuberculosis of lymph nodes
— corticosteroid treatment of sarcoidosis
— emphysema

(ii) *Common conditions for which information is lacking on causation, course, prognosis and management.*

Pneumonia developing in the community.

(iii) *An uncommon but serious outcome of a common disease*

The circumstances of death from asthma.

(iv) *An important practical problem on which little research has been undertaken in the setting of thoracic medicine.*

Techniques of persuading patients to stop smoking (3 studies).

(v) *An attempt to hasten recognition of suspected environmental and occupational causes of disease.*

A reporting system for suspected occupational causes of asthma (under discussion).

(vi) *Study of regional differences in occurrence, severity and management of diseases.*

A continuing analysis of data on hospital admissions, GP consultations and check rates for asthma in different regions of the country, with a view to studying influences of quality of medical care, provision of resources, methods of treatment and education and outcome (under discussion).

(vii) *Study of the clinical value and the safety of new methods of investigation of lung disease in ordinary clinical practise.*

A study of lung biopsy.

As a means of organising some types of clinical research within our field of medicine, the structure adopted by the British Thoracic Society seems to have certain advantages:

(a) The research priorities set by a Committee which is comprised of practising clinicians from different regions, tend to reflect the needs of ordinary patients as seen in the setting of the National Health Service, and to take account of demographic and social differences across the country.

(b) A Committee which has no commitment to one particular narrow field or technique of research and which can be sure of support from members of a large Society, is in a good position to initiate research in clinically important but neglected or "unfashionable" fields and to "fill in gaps" in research which is not being undertaken by others.

(c) The tradition of ready access to, and of willing support from, members of the Society (who comprise virtually all thoracic physicians in the country) places the Committee in an ideal position to carry out surveys on epidemiological studies.

(d) The Committee, through its contacts with members of the Society and its formal or informal links with other major research groups, is kept aware of research work in the respiratory field throughout the country (and overseas), and can thereby avoid unnecessary duplication of research effort. It can also divert appropriate projects to other groups.

(e) The Society's research projects encourage clinicians who might otherwise take no active interest in research (through lack of resources, time or experience) to participate in major studies and become involved in publication and presentation of results.

(f) The results of research are not only published in medical journals, but are invariably presented to meetings of the Society, hence ensuring wide dissemination of the results and encouraging changes of practise which might then be desirable in the light of research findings.

The research activities of the Society have not been found to compete or conflict with those of other groups or individuals. The Committee maintains close links with other research groups and participates in joint discussions on the appropriate "base" for individual projects (for example Medical Research Council groups working on lung cancer or on tuberculosis).

It seems unlikely that the Research Committee will contribute to predominantly laboratory-based research or to research on basis mechanisms of disease, but it seems to have a sure footing in continued clinical (patient-based) research, and in epidemiological research.

Finance. The Treasurer of the British Thoracic Society is ex officio a member of the Research Committee. Whereas the Society may be able to underwrite the costs of initial discussions of new projects, funding for work studies is sought from outside sources. Of late the Society has been asked to meet the cost of some small studies from its own funds.

Sub-Committee II—Medical Research requested answers to nine specific questions which are as follows.

(a) With respect to thoracic medicine the current priorities for research do not seem to reflect the needs of the National Health Service or of the nation. Respiratory diseases accounted for 20 per cent of all deaths in Britain in 1981, exceeded only by heart disease (27 per cent).[1] In the analysis by Black and Pole[2] of the burden of disorders of different organic symptoms to the community, the greater burden was produced about equally by respiratory and mental illness (excluding lung cancer). In their terms respiratory disease was responsible for 13.5 per cent of the total "burden" of disease.

Respiratory disease accounts for a substantial proportion of the total medical care requirements in Britain. It is the cause of nearly one third of all absences from work and is responsible for the loss of 50 million working days. One in five people die of lung disease.

Bronchitis, emphysema and other chronic lung diseases are responsible for 10 per cent of the occupancy of hospital medical beds. They cause over half a million periods of sickness absence from work per annum, and 10 per cent of working days lost in Britain. Sixty five thousand people were in receipt of invalidity benefit on account of chronic respiratory disease in 1982. The number of claimants has remained fairly constant over the past 15 years. A recent study of persons receiving invalidity benefit revealed that half of them had never had either a specialist thoracic medical opinion, or had any tests of lung function. The cost of this sickness benefit at 1980 rates was in excess of 100 million pounds.

Lung cancer is the commonest cancer in men and its occurrence in women continues to increase rapidly.

(b)(c)(d) In view of the importance of respiratory disease as a cause of mortality, disease and disablement, the funding of research for respiratory disease is grossly inadequate.

(e) In respiratory diseases as mentioned above, results are disseminated by Society's meetings and in the journals.

(f) The Society's Research Committee ensures that duplication of research effort is avoided.

(g) Research into health education in the two important fields of tobacco smoking and education of asthmatics is scanty and disorganised. Official funding is slender or absent and in the field of asthma (a disease affecting one in 20 of the population). The sole educational research seem to be from charitable funds, even though education may be one of the major routes to improved therapy.

(h) In thoracic medicine there have been reductions of staffing and resources both in National Health Service departments and particularly in Universities and Medical Schools. As a result it is increasingly difficult for young clinicians in training to receive training and experience in research methods. The clinical work load in many teaching hospital departments makes it impractical for registrars or senior registrars to devote sufficient time to research, and few if any funds are available for those able to do so. There is no financial or other provision for newly appointed consultants to increase their experience in research and few job descriptions outside major postgraduate centres do more than pay lip service to research.

[1] *Office of Health Economics*—Compendium of Health Statistics London. Office of Health Economics. 1984.
[2] *Black D A K and Pole J D* Priorities in biomedical research: indices of burden. Br. J. Prev. Soc. Med. 1975. *29*, 222.
[3] *Fleming D and Crombie D R* Prevalence of asthma and hayfever in England and Wales. Brit. Me. J. 1987. I 279.
[4] *Burley P J* Asthma mortality in England and Wales: evidence for a further increase. Lancet 1986 II 323.

Few senior registrars are able to devote a year (or more) to a proper research training. Rotation of posts makes such provisions impractical, even if funding can be obtained which is unlikely.

Kenneth M Citron, MD, FRCP
President of British Thoracic Society

John Stark, MD, FRCP
Chairman, Research Committee, BTS

April 1987

Letter from the British Toxicology Society

The British Toxicology Society is grateful to the Sub-Committee for the opportunity to respond to its questions of 3 March 1987 on the organisation and support of medical research and related health sciences.

It presents views based on consideration by its Executive Committee.

The Society is an academic society representing all types of scientific interests in toxicology in Britain, namely biochemistry, pathology, pharmacology, ecotoxicology, and related aspects of immunology, human and veterinary medicine, poison control centres, behavioural and developmental studies, teratology, chemistry and occupational hygiene. It comprises 700 members, many of whom work in industry (pharmaceutical, chemical, agrochemical and petrochemical), others in university departments, including medical and veterinary schools, research council laboratories and research associations. Many exercise scientific and regulatory functions in government departments and advisory committees.

Question:

(a) The priorities are set by a combination of what appears feasible to a given individual at a particular time, and in a particular setting, in the light of available basic knowledge, perception of the interest and likely solvability of the problem, and the availability of resources of staff, equipment, money and in case of clinical work (human or veterinary) the patients or data required.

The connection with the needs of the NHS and of the public health depends on individual perception. Attention is also directed by funding deliberately focused on particular areas, for example by single topic charities, restricted "programme grants," concerns of the pharmaceutical industry etc.

(b) Such balance as exists is achieved by a type of market mechanism of interaction between the scientific interest and solvability of problems (itself dependent on sufficient understanding for problems to be defined), their appeal to scientists, and their attractiveness to central, industrial and charitable bodies willing to fund work.

We do not know if the balance is correct, because there appears not to be an audit of the human or material resources divided into different subject areas, although such an accounting should be possible, taking into account government, charitable and industrial sources.

There will always be a mixture of basic and applied work, both subject to the influence of fashion and topicality. As has already happened in the physical sciences, certain types of biomedical work are coming to require such scarce or costly resources that central provision of facilities for national use has already begun to appear, and deserves further development. Consultation between providers should be encouraged to ensure availability of such resources (for example modelled on the MRC's "Brain Bank"; topical MR scanning for refined in vivo biochemical analyses) and the portable funding that ensures ready temporary attachment by would-be workers.

Industry can make its interests known very directly by what it is willing to fund, and it is assumed to know what mix of short- and long-term research it requires. Academic bodies have become increasingly sensitive to industrial application and concerns, but it is important to maintain a balance between long term fundamental work, which industry tends not to support generously, and the shorter term, applied research, in which it is very directly interested.

(c) Priorities do change in response to the factors named, but the lag may be considerable before interest and support concur.

(d) In part this has been answered in "a" and "b".

We believe that scientific progress and commercial exploitation could be aided if there were some means to encourage industry and government to undertake more short term and applied

work in academia, where it would aid training and promote speedier exchange of ideas. This argument is based on analogy with the USA, where there is far more direct collaboration in basic and applied work between the parties involved. Expansion of the CASE awards to more senior workers and to additional biomedical areas might be considered.

There would be considerable benefit to academic resources and the general scientific community's ability to tackle problems if central resources were deployed by more extensive contracting-out of studies to universities and other research groups, as there would then be a larger pool of active scientists, greater awareness of the problems to be solved and better appreciation of both the short and longer term implications of focused needs, for example making the Rothschild mechanism work at the right level by harnessing academic potential of minds and skills to practical needs.

(e) Dissemination is probably adequate, although patentability fears have had an effect on aspects of biotechnology and diagnostic devices and procedures.

(f) This can only happen via the knowledge of funding bodies and peer review. The mechanism can be distorted by fashion. Duplication does occur but that is not necessarily bad, because of the scientific need to demonstrate reproducibility (in industrial terms "reliability") and the importance of training by limited repetition.

(g) Advances in medicines, diagnostic and therapeutic instrumentation are implemented—provided that their cost can be borne. Rationing of costly facilities by the scarcity of funds and relying on individual enthusiasm to overcome cost barriers are irregular and rough mechanisms.

Cost-benefit analysis should be further developed and used, bearing in mind that an inadequate home base will not support development of a new industry.

(h) There is a continuing need to link advances in the basic sciences of biochemistry, immunology and molecular biology with clinical work. Here, MSc/MPhil courses funded at a level to permit attendance by medical and non-medical graduates could be improved.

Greater awareness, perhaps achieved by similar means, of physics and engineering in the biomedical field should be encouraged.

There remains in many non-medical and non-biological faculties a considerable lack of awareness of the existence of biological problems open to exploitation, for example consider how many undergraduate courses in physics or engineering include any biological topics—and those students will not have studied biology at school since O-level at the latest.

(i) The life of the PhD student, and early post-doctoral worker, especially in London, is one of relative poverty, which deters many from considering a career in, or even from seeking a postgraduate research qualification in, biomedical research. This could be overcome by more generous funding, so that bright scientists receive as much as young secretaries and clerks.

Security of employment and adequacy of career structure are too complex to be considered here, but it would be valuable if it were possible to facilitate ready, two-way movement of young scientists between institutions and to and from industry.

The Society would be happy to expand these ideas by presenting oral evidence should that be desired.

A D Dayan
Vice Chairman of the British Toxicology Society

April 1987

Memorandum by BUPA Medical Research and Development Limited

BUPA Medical Research and Development Limited (BMRDL) is a registered charity and has an annual budget of approximately 175,000 pounds donated from various sources within the BUPA organisation. The activities are the responsibility of a Board of Governors chaired by Lord Wigoder.

Dr Carolyn Ritchie PhD head of the BMRDL research group, has a staff of four graduates, some limited laboratory facilities and extensive in-house computer capability. The Board has Professors Martin Vessey, George Teeling Smith and Nicholas Wald as advisors. Earlier this year Professor Tom Whitehead was appointed Chief Scientific Advisor and works with the group on a part time basis. There is particularly close liaison with Professor Wald's Department at Bart's and one senior member of his staff is financed by BUPA.

BMRDL was formed to research into the methods and results of health assessment of individuals attending the BUPA Medical Centres situated in various parts of the UK.

Each year approximately 10,000 men and an equal number of women undergo health assessment; such activities have been carried out for twenty years. A variety of assessments are used but include anthropological, clinical and laboratory measurements and examinations. All results on males are held on computer files and this has been so for eight years. Only selected results on females are held on computer but this is being remedied at the present time.

The individuals are predominantly from Social Class 1 and 2 with some in Class 3. Surveys show that 95 per cent of these attending regard themselves as "healthy" and attend for reassurance regarding their health; often encouraged by their employers.

The research into health assessment is conveniently summarised as follows:

Operational. The group is responsible for monitoring the quality of laboratory and other investigations at the BUPA Medical Centres and organising methods of data collection and presentation. Work on quality assurance of laboratory investigations has led to important contributions to the literature.

Clinical. This aspect of research is predominantly concerned with assisting in the correct interpretation of health assessment data, but also assessing trends over the years and the results of counselling individuals on smoking, alcohol abuse and quantitative and qualitative changes in diet. Determining the efficacy of the introduction of new tests is also the responsibility of BMRDL.

The uniqueness of the data in characterising reference ranges in the "normal", albeit higher income groups, has also led to several important contributions to the literature concerning differences between the results from males and females and changes with age.

Epidemiological. An important part of the research work is based upon "flagging" of individuals at the time of their health assessment and also deep-freeze storage of blood serum collected at that time. When the individual dies a copy of the death certificate is received by BMRDL. With some verification, after enquiry of the certifying doctor, comparisons can be made between those who died of a certain condition and the results of the medical screening. It is not possible to carry out such work continuously but in 1976–79 20,000 men were "flagged". Approximately 500 have died and meaningful data on heart disease. alcohol abuse and other conditions are now becoming available. Using BUPA health assessment data and retrospective analysis of serum from the individuals studied Professor Wald has produced a series of important papers on the effects of smoking on disease states. An important feature of such research and the unique potential of BMRDL Research is the long time span between observation and result. A programme concerned with the early detection of osteoporosis in women is about to commence.

A collaborative programme between BUPA Medical Centres and equivalent centres in Tokyo and Milan, based upon careful maintenance of quality in laboratory and clinical measurement has now been established and is yielding important comparative epidemiological research results.

Although the results obtained may not be representative of the whole population in the UK we believe BMRDL has made and will continue to make important contributions to medical research in the UK. In the future there will be increasing opportunities for hospital service research as BUPA develops its policy of building and running its own hospitals. BMRDL is now responsible for monitoring the quality of BUPA Hospital laboratories.

The availability of a large number of "normal" individuals willing to provide information and material for research is obviously attractive to other research groups. Cooperation in research with such groups is an important feature of the work of BMRDL and at the present time there is active collaboration not only with Professor Wald's department but also Departments in Charing Cross, Hammersmith and Guys' Hospitals as well as the Imperial Cancer Research Fund.

Professor T P Whitehead
Chief Scientific Advisor

Memorandum by the Cancer Research Campaign

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

We believe that the current financial difficulties in biomedical research are likely to have a long-term detrimental impact on the provision of health care and on the general health needs of the nation. It is a matter of serious concern that inadequate funds are available to support much of the best research. The nation's medical research portfolio has been determined partly by the expertise which has developed over many years, and for which the UK is particularly well equipped, and partly by the public perception of priority areas which they are willing to support. There is also a substantial but nonetheless inadequate

funding of research by industry in commercially profitable areas. We cannot allow the development of research to be determined solely by commercial considerations or by the sympathies of the general public. There is a great requirement for fundamental research which will not be recognisable either to the general public or to industry. Moreover there is also a need for research in areas which are easily identifiable but which are neither glamorous nor profitable. In such areas continuation of support from Government funds is absolutely critical.

With regard to cancer research, we believe that the Government investment in this field, representing less than 30 per cent of the total funds available to such research is grossly inadequate. This in no way reflects the needs of the NHS or the nation in what constitutes one of the major health problems of the present day. We must therefore express alarm at the indications that the Government appears to be gradually withdrawing funding from this important field.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

It is difficult to say whether the present balance between different branches of research is right, as there are no formal criteria or priorities by which to measure this. It must be said, however, that this is unlikely to be the case, bearing in mind that the different vested interests which currently determine the support of biomedical research are not necessarily or absolutely concerned with the general health needs of the nation.

Priorities are likely to change in times of economic hardship and for this reason clarification of such priorities becomes more important. In particular the balance between pure and applied research is likely to alter. When adequate resources are available, pure research can be encouraged to a greater extent. Conversely, in times of financial restraint one is likely to find an increased emphasis on directed research. It is unfortunate and extremely short-sighted that at the present time a drastic shortage of public funds to support basic research prevents scientists from being able to pursue original and imaginative leads because such studies do not appear to have an obvious and immediate application. It should be recognised that many advances in medical science in the past have been achieved from precisely such innovative investigations, and the failure to support an adequate level of strategic research will in the long-term be extremely detrimental. The level of Government funding of medical research has now reached such a low level, it becomes impossible to envisage programmes that could be cut without further serious consequences to the long-term health of the nation.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

Obviously one would hope priorities would adapt in this way, but there is not always much evidence that this is the case. There are still alarming regional variations and socioeconomic differences both in patterns of disease and in access to health care. The problems of old age, and of illnesses such as stroke or Alzheimer's Disease, remain underresearched. The Government does not always respond to important changes with the speed which is demanded, and when it does act it tends to be in response to public pressure rather than from its own initiative. An important such example can be found in the time taken for the Government to decide to make available additional resources for research into AIDS.

Within specific subdivisions of medical research, of which cancer research is one example, the potential of the new techniques of biotechnology in the management of disease are increasingly being recognised and provide one important reason for an increase in the research effort. Similarly, improvements in the survival time for patients with some cancers necessitate more research into improving the quality of life.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

This has already been touched upon. In the main, charitable funding of research is influenced by the charity's ability to attract funds and the public's willingness to give. Commercial funding is to a large extent available for those aspects of research which are likely to be commercially exploitable and therefore profitable. It is because of these vagaries that the need for adequate central funding by Government arises. There has to be a core of research activity that is directed to meet the needs of the nation as decided by the process of peer review and in reality this can only be provided by public as distinct from charitable and commercial sources.

(e) *Are the results of research adequately disseminated?*

This must be dealt with in respect to different target populations. The impact of research results on the general population, Government officials, the media, medical practitioners or scientists, is likely to vary considerably in response to very different constraints. In the case of the scientific community the steadily increasing number of workshops, symposia, meetings, conferences and congresses, as well as scientific

journals, ensures that such information *is* being adequately disseminated. The same cannot be said of all the other categories mentioned above.

(f) *How is unnecessary duplication of research effort avoided?*

Informally, and probably most effectively, by the scientific community either because it is the primary objective of scientists to conduct original work and not to unnecessarily duplicate that of others. Additionally those scientists involved in the peer review system are so aware of what is going on in their respective fields that unnecessary waste of effort is prevented.

More formally, at least in the cancer field, the UK Coordinating Committee of Cancer Research has this as one of its remits. In addition there are registers of ongoing research projects, including clinical trials, available via the International Union Against Cancer (UICC).

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

On occasions but to a limited extent and not to the best effect. This is apparent in so far as cancer research and the control of cancer are concerned. Generally this is a consequence of the lack of funds and other resources available to the nation's Health Service.

A striking example can be found in the development of medical oncology in this country in comparison with North America, in particular, but also Western Europe. Medical oncology is a relatively young specialty whose evolution has had to rely heavily on charitable funding and which has been quite inadequately funded within the Health Service.

(h) *What changes in priorities in the training of medical researchers are needed?*

In the first instance other priorities have to be changed before the training of medical researchers becomes the key issue. At the present time the lack of career opportunities means that we are training scientists in our universities, only to see them subsequently pursuing careers in industry, abroad, and even ultimately in entirely different disciplines such as law or accountancy. Job opportunities and a good career and salary structure are fundamental to the recruitment of potentially able young scientists. There is also a need for a career structure for that cadre of medical researchers who are not necessarily highly original scientists but who form the backbone of medical research efforts. Similarly greater support for university teaching is crucial in that most research depends heavily on those who have been trained in our universities. Better opportunities should also be available to train clinical scientists. To achieve this the career development of doctors has to be modified so that those who wish to can afford to spend at least three years in a first class laboratory without feeling that their specialist career development has suffered.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

Most definitely. The whole structure and financing of medical research needs to be reassessed. From what has been written above it can be deduced that there is an urgent need for adequate—and therefore increased—funding to be made available centrally from Government. Without such an increase the support in particular of basic biomedical research will continue to suffer. This will inevitably also reflect on the quality of clinical and applied research. Additionally, and seriously, this erosion will mean that there will be no adequate base on which to build future developments which will be necessary to improve the quality and efficiency of health care in the United Kingdom. Ultimately without sufficient resources, and without the high quality of medical research we have come to expect, the NHS will no longer be in a position to oversee the health of the people which it is pledged to protect.

December 1987

Statement to the House of Lords Committee on Science and Technology from the Cancer Research Campaign

The issues we wish to elaborate upon are as follows:

(1) The statement, made in response to a particular question, that there is *not* a distortion in funding whereby research priorities reflect many different vested interests.

(2) The belief expressed on behalf of the Association of Medical Research Charities that the charities would welcome, indeed urge the setting up of a national forum "to thrash out issues below national policy level".

These two issues are interrelated.

The Cancer Research Campaign strongly believes that the nation's medical research portfolio is distorted in two particular ways. In the first instance it is our view that the money given to any charity is determined by the public's perception of the merits of that charity's main objects. This does not necessarily reflect disease patterns within the nation. The underfunding of research concerned with the problems of old age, mental health, heart disease and stroke exemplify this point. A second important source of distortion arises because of the substantial funding of biomedical research by industry. Such research is inevitably carried out where commercial considerations are paramount. It is also worth noting that such funding is invariably short term.

A national research portfolio which relies too heavily on a range of vested interests must be seen as something of a lottery, despite the good intentions of the various funding agencies involved. We should not allow the development of biomedical research in the United Kingdom to be determined solely by commercial considerations, or by the sympathies of the general public. There is a need for research which may be easily identifiable, but which is neither profitable nor emotionally appealing.

The Cancer Research Campaign would welcome the setting up of a national forum for discussing these and similar problems. We believe, however, that this should operate *at* and not below national science policy level. It could be argued with some justification that such a forum will merely serve to reinforce the vested interests which it represents. For this reason we feel that it is absolutely critical that there is a substantial element of central funding to support the basic biomedical research base in order to complement the support from the charities and industry. The Campaign would be very worried if such central support was lacking, and it was left to the whims of charity or industry to provide such a base.

December 1987

Memorandum by Ann Cartwright, Institute for Social Studies in Medical Care

CREDENTIALS

I have been working in the field of health services research for over 30 years. Since 1970 I have been director of the Institute for Social Studies in Medical Care. The aim of the Institute is to study the social aspects of health care in ways which have a bearing on social policy. Within this broad field the Institute has concentrated on four areas: general practice, maternity services (including birth control and abortion), the particular needs of elderly people and death and dying. A concern with the viewpoints of both those using and those providing services is fundamental to our approach. Most of the studies have been national ones covering between eight and twenty areas of England and Wales selected in such a way as to give a random sample of the relevant population. Opportunities have been taken in many studies to investigate and improve survey methods.

Until 1975 all the Institute's work was funded on a project basis and it obtained grants from the Nuffield Provincial Hospitals Trust, the College of General Practitioners, the US Public Health Service, the Ministry of Health and the Office of Population Censuses and Surveys. Since 1975 its major support has come from the Department of Health and Social Security in the form of a rolling grant, but it has also received grants for projects from the Medical Research Council and the North East Thames Regional Health Authority.

EVIDENCE

My written evidence is about two specific issues: ethical committees and the dissemination or censorship of the results of socio-medical research. It relates to two of the questions raised by the Sub-Committee:

(i) the changes in organisation needed to facilitate the quality, quantity or application of research; and

(e) the adequate dissemination of research.

Ethical committees

The present structure of ethical committees, based on local areas and hospitals, inhibits, frustrates and delays the execution of national studies covering a number of areas. A national organisation is needed so that researchers doing national studies do not have to submit proposals to several committees all with different forms, standards and interests. A national body should be better informed than local committees, and aware of the extent and the limitation of ethical considerations. At the moment some ethical committees concern themselves with the methods of research rather than its ethical implications. They seem particularly ill-informed or unaware of the ethical considerations of social research and some seem to apply the same criteria to the administration of questionnaires as they do to the administration of drugs or physical procedures.

In my experience local ethical committees not only fail to ask appropriate questions to protect patients' interests, they also interfere, or attempt to interfere, quite inappropriately with studies based on samples of individuals taken from public records (such as birth or death or electoral registration). They do not

appear to distinguish between such records and protected medical ones. For example, to suggest that before approaching people identified from public records the permission of their general practitioner should be sought, seems to me unethical. People do not belong to their general practitioners, nor are doctors the custodians of people's civil rights. There should be no interference with people's liberty to make up their own minds about what questions they should answer and in what circumstances.

To illustrate the practical problems, in a recent survey we have been asked to submit 17 copies of all our questionnaires to one local ethical committee. As there are seven questionnaires and we are planning to do the study in 14 areas (some of which are likely to be covered by a number of different ethical committees) this could involve us sending out more than 1,500 questionnaires before obtaining any interviews!

I recognise and applaud the need for well-informed and principled ethical committees but I deplore the proliferation of ill-informed, inappropriate interference which obstructs and delays constructive and harmless research.

Dissemination of research results

Our current contract with the DHSS has the following clause:

> "7.3 Subject to the provisions relating to confidentiality in this contract or any relevant project research contract, the Researcher may publish the results of his research in a learned journal or learned journals provided that he shall first submit a copy of the proposed publication to the Secretary of State at least 28 days before the intended date of submission to the journal, for the Secretary of State's comments, which shall have been communicated to the Researcher before publication may be made. Any comments which the Secretary of State makes shall be considered by the Researcher but the Researcher shall nevertheless be free to allow publication to go forward in the original form as he thinks fit. Every publication in a learned journal shall acknowledge the Department of Health and Social Security's assistance or carry such disclaimer as the Secretary of State may require, or both."

This seems reasonable. In a revised contract, which has been sent to some research units, this clause has been deleted and replaced by this:

> "7.2 Any publication of research material or of the results of research (as described in sub-paragraph 1 above) or of matters arising from such material or results is subject to the prior consent of the Secretary of State, which consent shall not be unreasonably withheld. Such consent may be given either unconditionally or subject to conditions, in which case any publication shall be subject thereto."

This is unacceptable because it gives the Secretary of State an unchallengeable power of censorship. This could restrict not only the publication of critical research findings but also the nature of research that is undertaken. If social researchers are to contribute to informed criticism of health services in a systematic and scientific way it is essential that there should be no question of their findings being censored.

Several directors of research units and learned societies are writing to the Chief Scientist of the Department of Health and Social Security to protest about this change in the terms of the contract. We hope to persuade the Department to revert to the earlier form of contract, but at the moment it is uncertain what the outcome will be.

Ann Cartwright

October 1987

Memorandum by the Chest, Heart and Stroke Association, London

The Chest, Heart and Stroke Association funds research into respiratory diseases and stroke. Stroke is third in the mortality league table—after heart disease and cancer—and the single greatest cause of serious disability. With chronic chest diseases, which are responsible for the loss of many millions of working days to industry, therefore, these two groups are responsible for a huge burden on the National Health Service—see Annex "A" in relation to stroke. Yet in both cases comparatively little research is funded either publicly or by Charities.

The priorities for medical research tend to be set by research workers themselves and by charities. In the latter case it is the emotive cause which attracts donations and there is no doubt that priorities in research are affected by the source of funding—see Annex "B". And, a lack of adequate research funding leads to a shortage of good young researchers entering a particular field. This is evident in relation to

both respiratory medicine and stroke. Given these forces, it is not surprising that research does not often reflect the needs of the National Health Service nor indeed of the population as a whole.

In our experience we believe the results of research to be adequately disseminated through published work and national and international conferences. Medical charitable organisations such as the Chest, Heart and Stroke Association which are multi-faceted are well placed to play their part. Not only is research funded, programmes of health education/promotion, rehabilitation, counselling and conferences are all sponsored.

Unnecessary duplication will to some extent be avoided in the charity programmes by the reconstituted Association of Medical Research Charities. Since each charity does have its own expert committees, however, it is not likely to eradicate all duplication but it is in any event arguable that this is altogether unnecessary. It would be helpful if expert committees could be prevailed upon to define the broad parameters in which research might be concentrated rather than reacting only to applications by individual researchers. Taking stroke as an example, should the main effort be in one of the four main compartments into which the disease tends to fall—prevention, early treatment, rehabilitation, long term care or equally divided between them?

It seems to us that there is a great imbalance in the resources available for medical research and that chest diseases and stroke are hugely neglected.

That is why the CHSA has launched a National Stroke Campaign, stroke being chosen rather than chest diseases since we are, as far as we are aware, the only medical charity funding stroke research to any significant degree.

ANNEX A

STROKE — THE RESOURCES IT CONSUMES

11% of all hospital bed days

19.6 per 1000 GP consultations

9% of community nursing services

£17.5 million in 1974 in Scotland (4.6% of total)

The incidence of stroke in the United Kingdom is approximately 100,000 new cases each year. Between 20 per cent and 30 per cent of these will die in the early days or weeks. Practice varies across the country but up to 50 per cent may be treated at home and, of course, those treated in hospital and who survive return to the community for continuing care. It is estimated that up to two thirds of survivors have disability varying between moderate and severe.

ANNEX B

CHARITABLE FUNDING OF MEDICAL RESEARCH IN THE UK, 1984

	£ million
Imperial Cancer Research Fund	14.8
Cancer Research Fund	18.1
British Heart Foundation	6.2
Multiple Sclerosis Society	2.25
Chest, Heart and Stroke Association (Chest and Stroke Research)	0.22

ANNEX C

RESEARCH PROGRAMME FOR CHEST DISEASES — 1987

Dr R C Strang of Stoke on Trent

Project—A Study using gene probes of enzyme expression in neonatal lung disease—over three years £17,750

Dr Neil B Pride of London

Project—Origins of Bronchial Hyper Responsiveness in Middle-Aged Male Smokers—over three years £19,470

Dr Noor Kalshekar of Cardiff

Project—The characterisation of a putative serine-proteinase inhibitor closely related to alphal-antitrypsin and its potential importance in chronic lung disease—over three years £30,270

Dr R W Fuller of London

Project—Sensitivity of the cough reflex in normal subjects and patients with unexplained persistent cough—over three years £37,072

Professor A B Kay of London

Project—Studies on human bronchial and tracheal epithelial cells—over two years £49,084

Professor S T Holgate of Southampton

Project—Mechanism and significance of adenosine nucleoside and nucleotide-induced bronchoconstriction in asthma—over three years £49,839

Dr Peter Cole of London

Project—Bronchiectasis: use of an animal model to determine factors important in pathogenesis and treatment—over three years £59,651

R A Stockley MD DSc FRCP of Birmingham

Project—Control of alphal-antitrypsin in chronic chest disease – over two years £82,068

ANNEX D

RESEARCH PROGRAMME FOR STROKE — 1987

Dr M Anne Chamberlain of Leeds

Project—Investigation of the provision of care to stroke patients in the community—over one year £8,735

Mr Anthony Chant MS FRCS *of Southampton*

Project—The Natural History of Carotid Artery Disease in High Risk Patients—over three years £13,995

Dr John Young of Bradford

Project—A Randomised Trial of Home Rehabilitation and Day Hospital for Stroke Patients Leaving Hospital—over two years £25,806

Dr S P Stone of London

Project—The Prognosis of the Neglect Syndrome in Acute Stroke—over one year £25,360

Dr M G Harrison and Mr B S Aspey of London

Project—The relative Neurocytotoxicity of Cerebral Metabolities Currently Implicated in the Cause of Ischaemic Brain Disease—over three years £48,238

Mr P W Halligan, Dr J C Marshall and Dr D T Wade of Oxford

Project—Cognitive Aspects of Unilateral Visuospatial Neglect—over three years £49,124

Dr B S Meldrum of London

Project—Protection against Ischaemic Brain Damage by Reduction in Excitatory Neurotransmission—over 3 years £53,886

Memorandum by the Ciba Foundation

Introduction

1. The Ciba Foundation

The Ciba Foundation is an international, scientific and educational charity which was established in 1947. The scientific objectives of the Foundation are defined in its Trust Deed. Its general objective is to provide a range of services to science and scientists and thus contribute to the preservation, transmission and advancement of scientific knowledge. The Foundation's activities are predominantly in the biomedical sciences and these include:–

(a) the organisation of scientific meetings

(b) the publication of books in the biomedical sciences

(c) the provision of medical and scientific information for the media—the Media Resource Service

(d) the conduct of science policy research studies

(e) the provision of a science library and information services for scientists

(f) bursary schemes for young scientists

(g) the provision of conference facilities for other non-profit making bodies

The Foundation is a unique organisation which makes a major contribution to the infrastructure of biomedical research.

2. Science Policy Research Studies

The Ciba Foundation supports a small in-house research group developing science policy research studies. The group has established a number of studies into:

(a) the applicability of available techniques of performance evaluation to the biomedical sciences

(b) the impact and effectiveness of present methods for training research personnel

(c) the relative effectiveness of different mechanisms for funding research activities

The Foundation, as an independent body with extensive knowledge of the biomedical research enterprise, is particularly well-placed to conduct such studies.

3. Personal involvement in Medical Research

(a) *Academic and NHS background*

I have 15 years experience in academic medicine and have held university and NHS appointments (including a Consultant post) in university teaching hospitals. I have substantial experience in basic biomedical and clinical research. I have published over 50 full original scientific papers and made over 50 other contributions to the medical and scientific literature in the form of books, review articles, editorials and other publications. These principally cover my laboratory research activities, but also include papers on postgraduate education, research policies, international collaboration in biomedical science and performance evaluation of these activities.

(b) *Ciba Foundation*

I have 9 years experience as Director of the Ciba Foundation and during this period have been responsible for initiating and developing the Foundation's interest in science policy research studies. I have also taken an active interest in the organisation of biomedical research in the UK through the Association of Medical Research Charities and have been responsible for the collection and analysis of data describing the growing contribution of the charitable sector to biomedical research.

INTRODUCTION: THE FUNDING OF BIOMEDICAL RESEARCH IN THE UNITED KINGDOM

Biomedical research in the UK receives support from a number of sources. A Ciba Foundation survey in 1981[1] covering all publicly funded and charitable organisations engaged in biomedical research showed that support was derived as follows:

Medical Research Council (MRC) 34 per cent
Other Research Councils 12 per cent
Health Service Funds (central and regional) 9 per cent
Medical Research Charities 21 per cent
Other sources (overseas sources, industry and government departments other than DHSS and SHHD) 24 per cent

No comprehensive survey has been carried out since that time (the OHE booklet—"Crisis in Research"—contains data which must be treated with caution). The figures above will certainly have changed over the last 6 years with the growth of the contribution of the charitable sector (which now disburses funds similar to those of the MRC)[2] and the decline in the income of the MRC in real terms (when judged against an index of research costs rather than the Retail Price Index).[3]

A(i). *How are priorities for medical research set?*

The factors which determine funding policies and medical research priorities vary from sector to sector. A substantial proportion of the funds of the charitable organisations are donated for a specific purpose and are dedicated to research into a single disease or group of related disorders. These charities raise their funds directly from the public, and the amounts raised reflect their perception of the relative importance of these diseases. This is the only mechanism by which members of the public can have a direct impact on the determination of priorities and thus is of particular importance. It does, however, have its limitations

[1]Sadler, J, Porter, R & Evered, D. "Careers of non-medical graduates in British medical research." *Nature*. 1981, 293, 423–426.
[2]Evered, D. "Medical Research Today: What the Charities are doing." Ed. D Evered. London. AMRC. 1986, pp 4 7.
[3]Lamb, J. "Why Scientists are so hard up." *New Scientist*. 1985, 107, 61 62.

and those charities which exist as a result of private or corporate philanthropy (the Foundations) play a complementary role. These bodies are less restricted in the range of their activities and are able, in addition, to contribute to basic medical science and to support those areas which do not command public interest and would otherwise be neglected. The policies and priorities of the other major sectors which fund biomedical research (the MRC and pharmaceutical, medical equipment and diagnostics companies) are clearly determined by other factors. It is assumed that these groups will be submitting evidence which will address this question.

A(ii). *How do these priorities reflect the particular needs of the National Health Service and the health needs of the nation?*

It is not possible to answer this question in precise or objective terms. Much information which is directly relevant to defining the health needs of the nation is, of course, collected and made available by the health departments (for example data on notifiable diseases, hospital activity analysis, health authority statistics etc.). These data, however, only provide one part of the picture for two reasons.

(a) They only reflect those health needs which are evident to official agencies and which make demands upon public funds and it is well established that these figures underestimate the health needs of the chronic sick to a very substantial extent.

(b) These data do not reflect social needs which have a direct impact on health.

It must also be remembered that not all research objectives, however desirable in humanitarian terms, are at present scentifically achievable. It is probable, however, that despite these qualifications, the pattern of medical research in the UK does reflect perceived health needs to a significant extent. There is a clear need for further research in this area.

B. *Is the present balance between different branches of research right?*

This question raises two issues, both of which require debate.

(i) The balance between basic and applied (including clinical) research.

It should be clearly understood that basic and applied research are not distinct entities. They are merely convenient terms to describe the spectrum of research activities. It is impracticable and undesirable to separate these categories entirely since they merge imperceptibly one into the other. It is, of course, necessary for funding agencies to make a number of qualitative judgements so that both research of a more basic and that of a more applied nature will receive support. The essential contributions to medical progress which have been made by both basic and clinical scientists are well documented. There is no doubt that a balance is achieved both within and between sectors by informal consensus. The AMRC, for example, only make a limited contribution to research in the basic medical sciences since it is widely held that the MRC has undertaken the responsibility for the long-term commitment necessary to create a suitable environment for such research (for example National Institute for Medical Research, Laboratory of Molecular Biology and other MRC units). It is also generally thought that this is properly a responsibility of government.

These observations do not, of course, provide an objective answer to the question—is the balance right? This could probably only be answered by consensus after debate between all major parties concerned—customers, contractors, funding agencies etc.

(ii) The balance between research in different disciplines.

There is no doubt that a balance has been achieved with respect to research in the various biomedical disciplines (and in relation to different groups of disorders). This has also been achieved by informal consensus and a number of pertinent points have been made above (see section A(i)). The same uncertainties, however, which were noted in the preceding section, apply to any judgement as to the rightness or appropriateness of this balance.

C. *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

The response to this question is largely covered by the responses to A and B (above) and is subject to the same qualifications—for example incompleteness of data upon which to make objective judgements, lack of suitable standards by which to judge performance etc. It can be argued, however, that the biomedical research community has in general responded promptly and appropriately in the past. Its ability to continue to do so will depend upon the availability of trained personnel, sufficient resources and an adequate knowledge base.

D(i). *How are priorities in medical research influenced by the institutions through which research is funded?*

Priorities are very substantially influenced by the nature and terms of reference of the various funding agencies involved.

(a) *The charities*

(see A(i)). It was noted above that many of the charities which collect money directly for the public are dedicated to research into a particular disease or group of related disorders—and others are conscious that other areas should not be neglected and that basic research should be adequately supported. The charities also commit a rather smaller proportion of their funds to long-term projects and thus they are more flexible and often more ready to provide seed money for speculative projects.

(b) *The pharmaceutical, medical equipment and diagnostics companies.*

These commercial undertakings largely limit themselves to applied research (and development) which is directed towards producing marketable and profitable products.

(c) *Public sources.*

The public funds (largely the MRC) are made available for basic and applied research in the biomedical sciences. Substantial sums are committed to establishing a suitable environment in which basic research can thrive and this inevitably means long-term investment (see B(i) above).

Dii. *How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

The priorities allocated to different programmes by the major funding agencies may be substantially affected by changes in the balance between sectors. This has been seen particularly clearly in the charitable sector over the last five years. The public, and the charities to which they give so generously, have played a vital part in the maintenance of medical research in Britain in recent years. Many charities have increased the range of their funding activities and have made long-term commitments to ensure that essential research continues.

A number of charities have also drawn on their reserves—an exceptional response at a difficult time. It should not be thought, however, that this progressive shift from the public to the voluntary sector can continue without inflicting lasting damage to the research enterprise in Britain. The assumption that the charities can take on the additional financial reponsibility of strengthening the research base is unwarranted. The charities just do not have surplus funds. Nor can they simply divert resources from the direct support of research to meet some of the costs of maintaining university departments. This would reduce the ability of charities to act as flexible and adaptable sources of money for new and innovative research as in the past. It is also unlikely to achieve the desired effect because it would probably lead to a reduction in income for those charities (the majority) which collect directly from the public. The public is unlikely to give so generously to bodies which undertake responsibilities generally perceived to be those of government.

E. *Are the results of research adequately disseminated?*

There can be little doubt that the results of research are adequately disseminated. Scientific and medical research are international activities that depend on effective communications for their progress. Before new findings and theories are accepted as part of science or medicine, it is customary for them to be shared, discussed and criticised by other researchers, and placed permanently on record. There are many means by which dissemination occurs but the most important of these are through medical scientific meetings and the medical literature (see also G below).

F. *How is unnecessary duplication of research effort avoided?*

It is important to stress that not all duplication of research activity is unnecessary. An essential step in the validation of any scientific advance is verification. It must also be acknowledged, however, that there is unnecessary duplication of effort in some areas.

The charities have taken substantial steps to avoid such duplication. The major charities in the United Kingdom came together in 1972 to form the Association of Medical Research Charities (AMRC). This body provides a forum for the chief executives of the charities and has played a key role in improving personal contacts between members. It has, as a result, provided opportunities for collaboration between members (leading to a number of jointly funded ventures) and has thus minimised duplication of effort and maximised the use of resources.

There are also a number of checks within the system which do militate against unnecessarily repetitive studies. These include difficulties in raising funds for such studies and the natural and proper ambitions of researchers to conduct original rather than imitative studies.

G. *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

There is a good and well-established communications network between those active in biomedical research. This results in a rapid uptake of such information within academic institutions (medical schools and university hospitals) where clinical care is generally of a very high standard. The application of research findings in patient care and health education is not always achieved as promptly as it might be

outside academic institutions. This is essentially a problem of continuing medical education and the essential issues have been highlighted in an earlier publication.[4]

H. *What changes in priorities in the training of medical researchers are needed?*

The mechanisms which have been established in the United Kingdom for training medical researchers have developed haphazardly and the importance and impact of the various schemes have never been evaluated adequately. This unstructured system has, in general, served the community well and was acceptable in the past when the university system was expanding, It is clearly no longer appropriate that available training schemes should continue without systematic evaluation.

The evaluation of these processes is one of the major objectives of the Ciba Foundation research group. These studies are absolutely essential to assess the value of existing and future training programmes and to establish their relative value and roles in providing a cadre of trained research workers for the future. There are a number of issues which give rise to particular concern at present. These include:

(i) the absence of an adequate career structure for non-medical graduates engaged in research in medical faculties

(ii) the relative shortage of training facilities and opportunities for both medical and non-medical graduates

(iii) the threat to the intercalated BSc course for medical undergraduates[5,6,7]

(iv) the professional and financial disincentives which discourage medical graduates from entering a career in research

It is essential that this system is evaluated critically. It clearly contains much that is good. It could do irreparable harm to the biomedical research enterprise in the United Kingdom if training programmes were subject to random or unselective "across the board" cuts before we know the precise significance and importance of individual programmes and have had the opportunity to consider how these will meet future needs.

I. *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

I have two major recommendations which are fundamental for the continued success of biomedical research in the United Kingdom.

(i) A national forum must be established in which all major parties concerned would be represented—research councils, medical research charities, pharmaceutical and medical equipment companies, relevant government departments (DHHS, SHHD, DES), medical researchers and possibly others. The objectives of this forum would include:–

 (a) the review of available data relating to needs, present research activities etc.

 (b) the collection of data on a regular basis to identify new areas of need and evaluate research activities

 (c) the determination of priorities and the establishment of a framework for future activities (this process would have to take scientific feasibility into account)

 (d) discussion of areas of responsibility

The Association of Medical Research Charities has established a similar forum for its members. A more broadly based forum would be invaluable in the future and will facilitate sensible collaboration which will be to the benefit of all.

(ii) It is clear from the foregoing evidence that many of the questions posed by the Sub-Committee cannot be answered in anything other than general and subjective terms. The case for systematic evaluation of research training programmes, the research process, outcomes and applications is overwhelming.[8] It is essential that policies and strategies should be based upon incontrovertible fact if limited resources are to be used to best effect. A number of organisations (including the Ciba Foundation) are now addressing these issues. It is essential that these bodies should be supported and encouraged and additional resources made available for such studies.

SUMMARY

A. *The factors which determine research funding policies vary considerably from sector to sector. It is not possible to state precisely how far established priorities meet health needs.*

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[4]Evered, D & Williams, H. "Postgraduate education and the doctor." *British Medical Journal.* 1980, 1, 626–628.
[5]Smith, R. "A senseless sacrifice: the fate of intercalated degrees." *British Medical Journal.* 1986, 2, 1619–1620.
[6]Wakeford, R, Lyon, J, Evered, D. & Saunders, N. "Where do medically qualified researchers come from?" *Lancet.* 1985, 2, 262–265.
[7]Evered, D Anderson, J Griggs, P. & Wakeford, R. "The correlates of research success." *British Medical Journal.* 1987, 241–246.
[8]Anderson, J. & Evered, D. "Why do research on research." *Lancet.* 1986, 2, 799–802.

B. *There is an established balance between fundamental and clinical research and between research in different disciplines. It is not possible to state if this balance is right or appropriate.*

C. *It is probable that medical research is adapting to changing needs within the limits of existing resources.*

D. *Priorities in medical research are influenced substantially by the institutions through which research is funded.*

E. *There are ample opportunities for the adequate dissemination of research results.*

F. *There is relatively little unnecessary duplication of research.*

G. *The results of research are not always incorporated within the framework of accepted clinical practice or in health education programmes as promptly as they might be. This raises the problem of continuing postgraduate medical education.*

H. *There are many schemes available for training researchers. Undoubtedly many of these are of value. The available schemes have been subjected to a systematic appraisal to determine their significance and importance.*

I. (i) *There is an urgent need for a national forum for all parties involved in the biomedical research enterprise. This would have clearly defined terms of reference. The objective of the forum would be to facilitate sensible cooperation and collaboration for the benefit of all.*

(ii) *There is also an urgent need for systematic evaluation of research training programmes, research processes, outcomes and applications. Such studies must be supported and encouraged and further resources made available.*

Memorandum by the City and Hackney Health Authority, St. Bartholomew's School of Nursing

Introduction

The St. Bartholomew's School of Nursing welcomes the opportunity to submit evidence to the Sub-Committee of the House of Lords Committee on Science and Technology about nursing research priorities.

This report will highlight initiatives which are already taking place with regard to nursing research and research into nursing education in this health district. It will also identify how nursing research priorities are arrived at and what we see as the way forward for nursing research and nursing education research in this health district.

The City and Hackney District Nursing Research Committee was formed in 1984 by members of the school of nursing and various clinical nurses and nurse managers to monitor and review nursing research carried out in the district and advise on research initiatives in nursing. The remit of this committee can be found in appendix A of this document.

Priorities for Nursing Research

In 1986 the City and Hackney District Nursing Research Committee began exploring the process of prioritising research in order to tentatively decide the best ways of utilising limited resources more efficiently and effectively. Our first concern was to identify the external and internal influences which could affect decisions about nursing research. Appendix B outlines these external and internal influences.

In terms of nursing education, the English National Board identified their research priorities for nursing education. These can be found in ENB document (85) 130, redrafted from ENB (85) 111. St. Bartholomew's School of Nursing has attempted to identify those ENB research priorities which are particularly relevant to nursing education in this district and focused its research efforts on these. These include the following:

Examination and Assessment

1. The development of criteria for assessing the clinical learning environment.
2. Development of the strategies for evaluating examination systems.
3. The effectiveness of current systems of continuing assessment for student nurses and the selection of alternative strategies.

Role and Role Preparation

1. A Delphi study to determine how trained nurses of today perceive the role of the nurse in the year 2000.
2. The preparation of nurses to undertake the projected role of the nurse in the year 2000.
3. Identification of Psychiatric Nursing skills and how they may be developed.

COURSE EVALUATION

1. Evaluation of a newly developed RGN programme using a case study approach.

In addition to ENB initiatives for identifying research priorities in nursing education, teachers in the St. Bartholomew's School of Nursing are undertaking their own research projects. These are monitored either by the district nursing research committee or by the Universities/Polytechnics at which degrees and higher degrees are being undertaken. These research projects include:

1. Curriculum evaluation—a long term study of reviewing the curriculum activities of the school of nursing.
2. Performance indicators in nursing education.
3. An Ethnographic study of a new assessment scheme in an RGN programme.
4. A comparative study of attitudes towards health amongst student nurses undergoing a new RGN programme which is health based and students undertaking a traditional nursing course.
5. A negotiated curriculum for post basic nurse education.
6. The provisions of mental health education teaching in basic nurse education.
7. A study to examine the preparations of nurses for the role as health educators.

In addition to these research initiatives with regard to nursing education the following clinical nursing research has been completed or is being undertaken currently into nursing in the clinical area.

1. A study of oncology nurses' awareness of ethical dilemmas in their ward practice.
2. A study of the effects of community noise and aesthetic factors on the behaviour of nurses and patients in an acute psychiatric ward.
3. A study of psychiatric patients admitted to hospital following deliberate self harm.
4. A study to assess nurses' knowledge of nutrition and their attitudes towards nutrition education.
5. A study of student nurses' recollection of the experience, teaching and support they received in the care of the terminally ill.
6. A study into the quality of life of cancer patients.
7. A study to assess appetite and taste changes in cancer patients.
8. A study of the incidence of pressure sores in the elderly.
9. A study into the effects of relaxation and stress reduction on cancer patients.
10. Evaluation of an education programme for nurses caring for patients tracheal stoma.

In addition to these, each group of students undertaking the associated degree course in conjunction with the City University and this school of nursing have to undertake a dissertation in their final year which is health care related. These dissertations are monitored by the City and Hackney Nursing District Research Committee and are co-supervised at the City University and at the St. Bartholomew's School of Nursing.

THE FUTURE

The external and internal influences affecting prioritisation of research, the research priorities laid down by the English National Board and the local and national changes occurring in health care and nursing and nursing education highlight the need for more research studies in nursing and nursing education. Although the need has been identified, resources for funding nursing research remain scarce. Decisions about manpower for example are being made without adequate research to support such decisions. The needs for the future therefore are as follows:

1. Using situational analysis techniques to analyse from current sources what are the external priorities.
2. Through existing consultation methods and techniques such as the Delphi study, elicit from staff what they perceive to be research priorities.
3. Look for areas of commonality between one and two above to establish areas of immediate, medium and long term priority.

At present the areas of high priority for nursing research as identified from many external sources as well as from within the health district are related to the following:

1. The role of the nurse and preparation for this role.
2. Identification of more appropriate methods for determining patient dependency and number of nurses needed.
3. Is there a role for care assistants and if so what is this role to be? Who decides what help a nurse needs?
4. Systematic study of the most appropriate types of nursing courses to attract people into the profession.

5. Rationalization of continuing education programmes for nurses.
6. Research into ways of measuring quality of care and setting standards of care.
7. Research into the many areas of clinical nursing practice which at present are performed out of ritual but may not have research based rationale.
8. Research into appropriate grade mix and skill mix in nursing.
9. The effects of nursing information on recovery and/or well-being.

All these areas where research is needed highlight several practical problems:

1. Funding is required to set up nursing research units in each health district where properly trained research nurses can undertake commissioned research projects into areas of high priority for that district.
2. Resources and staff are required to enable nurses who so wish, as an integral part of their work, to undertake local supervised action research studies.
3. Research which is carried out by nurses or into nursing must be monitored by a district nursing research committee.

Di Marks-Maran,
Senior Tutor for Curriculum Development and Research.

On behalf of the senior nursing staff of the City and Hackney Health District including St. Bartholomew's School of Nursing.

Appendix A

CITY AND HACKNEY HEALTH DISTRICT
DISTRICT NURSING RESEARCH COMMITTEE

Remit of the committee

1. To define and describe criteria for research.
2. To plan and formulate research policies for nurses, midwives and health visitors.
3. To establish research priorities within the district.
4. To monitor and coordinate all nursing research taking place within the district.
5. To make decisions about:
   (a) The need for research
   (b) The viability of proposed research projects
   (c) The ethical aspects of research carried out in the district
   (d) Future research.
6. To liaise with Directors of Nursing Services about research initiatives and research findings.
7. To promote research awareness and the use of research findings through recommendations to the procedure committee, educational programmes and the application of research to nursing practice.
8. To act as a resource group for nurses, health visitors and midwives throughout the district.
9. To liaise with local, regional and national nursing research organisations such as the RCN Research Society, Northeast Thames Regional Research Link Group.
10. To liaise with other district research committees.
11. To maintain a district research index.
12. To monitor nurse participation in research being undertaken by other disciplines within the district.
13. To develop strong collaborative links between this committee and the Quality of Care Unit.

August 1985

Appendix B

Prioritising Research

The determination of what is appropriate as a subject for research, any research, is a most complex issue. In health care the difficulties are made that much worse by two factors:

1. The field of operation is ill-defined that is, what is considered to be health care is ever changing.
2. There are so many possible subjects worthy of research.

In many respects nursing suffers from the effects of these factors rather more than any other of the health care disciplines because of its range of activities and the changing nature of its responsibilities.

The determining of priorities is an essential part of the process that needs to be undertaken in order to decide the best ways of utilising limited resources most efficiently and effectively as well as ensuring that the objectives of the profession both at local and national levels are achieved. While a number of possible methods for prioritising the disposal of research resources are available, it may in the short term be better to take a multi-faceted approach in order to ensure as many of the possible sources of prioritisation are both considered and involved. The following represents a first attempt at identifying those sources within this District. The listing divides into external and internal to indicate that no health care delivery system operates in total isolation, in research terms it both gives and takes from the total health care system in the NHS.

External

1. Governmental priorities	—societal deprivation —population movement
2. DHSS	—skill mix —PIs —Korner
3. Specialist Agencies	—HEC —BDA —King's Fund
4. Statutory Bodies	—ENB —UKCC
5. Professional Organisations	—RCN —RCM —HVA
6. Pressure Groups	—Patients Association —NAWCH —CHC
7. Research Centres	—Universities —Research Units

Internal

1. Professional concern	—clinical —managerial —educational
2. Management Team decisions	—manpower —clinical developments —district projects
3. Health Authority	—resource allocation —strategic planning
4. RHA	—resource allocation —strategic planning —multi-district projects
5. Research by other HCPs	—multidisciplinary work —parallel research

This is a very broad categorisation of possible sources of priorities and indicates the range of views to be consulted. However, it implies that in many senses the research prioritising process is a top down one. This, of course, is not true as many initiatives spontaneously arise from within the service and need to be cultivated.

The process for determining priorities is a complex one and really consists of two phases.

1. Awareness of priorities already set.
2. Generation of priorities.

It is an on-going process requiring regular and planned review.

Proposals

1. Establish from current sources what the "external" priorities are.
2. Through the existing consultation mechanisms in the Health Authority, elicit from staff what their priorities are.
3. Look for linkages between internal and external priorities with a view to establishing funding options.
4. Contact research centres to discover if there is any interest in further involvement.

Letter from Professor C G Clark, Department of Surgery, University College and Middlesex School of Medicine, University of London

I have delayed writing in response to your letter of 7 April principally because I thought Professor Semple had covered many of the points which affect academic departments with respect to their somewhat uncomfortable relationship with a reorganised Health Service. In addition, of course, I shall be responding to some of your enquiries wearing another hat, namely, as Chairman of the Federation of Associations of Clinical Professors. However, I could add one personal comment which may be of assistance to you. It would be the following.

The reduction of university financing places considerable burdens on academic departments. In surgery, with a heavy service load, this burden is compounded by a reduction in NHS staff but there is a further twist in the tail in that the academic departments are responsible for teaching and where there is any reduction in the NHS staff, an increased load of both teaching and service is translated to the academic departments. As a consequence, we have reduced resources and an increased work load. Perhaps this is what you were thinking of when you noted in your letter that the researchers are in general overworked. It has even more far-reaching consequences. Most of the young research workers are enthusiastic but in a sense they are obliged to do research in order to advance their careers. What is tragic, however, is that the consequence of the changes going on at the present time have inevitably reduced the number of people interested in following an academic career and I see grave problems in the not too distant future in finding suitable people to fill academic posts.

As you know, I have a very large department and as a consequence I can cope with most of my commitments by asking some of my research fellows to do a little teaching.

Most fellowships, such as those of the MRC, do allow research workers to spend no more than a few hours in such activities and I am grateful that they do so, for without them I really would be unable to fulfil my teaching commitment. You will be well aware that a great deal of research has been done, particularly by NAHA, into the problems of university funding. Nowhere is the problem more acute than in academic surgical departments because of the nature of their work and the considerable amount of time required to be spent operating. It is sometimes not appreciated, particularly in the Department of Education, that academic surgeons fulfil a role in the hospital which is usually equivalent to, and sometimes greater than, that of the NHS consultants.

I do appreciate how difficult it is for people to understand the interrelationships between the clinical academic departments and their hospital role. I hope that at some point you may have the opportunity to have this discussed for it is quite crucial to the future of the existence of such departments and it is only the existence of such departments that can help to promote medical research, particularly that type of research that has a bearing on the needs of the National Health Service.

C G Clark

April 1987

Letter from the College of Health

PRIORITIES IN MEDICAL RESEARCH

I am most grateful to you for giving us the opportunity to set out our views on priorities in medical research with particular reference to the needs of the National Health Service.

The College of Health has some 11,000 members and one of our main aims is to help people make the most effective use of the health service. In this context we have published three editions of a Guide to Hospital Waiting Lists and will shortly be publishing a fourth. We are also in active discussion with a number of health authorities and boards about how they might become more responsive to the needs of consumers.

As we have neither the staff nor the resources to address ourselves to all the questions set by the Science and Technology Select Committee, I hope that it will be acceptable if we limit our response to one aspect of medical research which we believe to be of fundamental importance to patients—the use of performance indicators to measure the quality of patient care and outcome.

Our concern is that the performance indicators currently in use in the NHS are too restrictive. They measure inputs such as the number of beds available and staffing levels. They measure throughput in terms of the numbers of patients treated and the number of days they stay in hospital and of course they measure the amount of money spent on every single aspect of the service. But when it comes to outcome, the main

performance indicator is the incredibly crude lumping together of deaths and discharges as though it does not matter which way up patients leave hospital as long as they can be counted as having left.

None of the indicators address the much more important questions of whether patients who should have got better, in fact did so; whether there were complications which should not have occurred; whether patients acquired infections or pressure sores while in hospital which could have been prevented with better nursing or infection control techniques; whether patients were left disabled or suffered adverse reactions to the drugs with which they were treated; whether they had to be readmitted to hospital.

We believe that there is an urgent need for research to be carried out on a systematic basis to measure the quality and the outcome of patient care. We accept that health service managers need information about costs and processes and hope that clinicians may be persuaded to adopt the same techniques of measurement and information retrieval in the interests of patients.

Marianne Rigge
Director

April 1987

Letter from Dr J E Cotes, University of Newcastle upon Tyne

Medical research and the NHS

Evidence from Dr J E Cotes

(a) *Status:* Reader in Pulmonary Physiology in University Department of Occupational Health, Honorary NHS Consultant in Clinical Respiratory Physiology, Newcastle upon Tyne. Due to retire in 1989.

(b) *Personal involvement:* Research into the causes, mechanisms and prevention of respiratory impairment and disability, particularly that of occupational origin or due to smoking.

(c) *Funding:* Salary and minimal support grant from Medical Research Council as member of their external scientific staff. Additional laboratory funding from project grants (MRC, HSE and ECSC), also consultancy fees and donations.

Organisational changes which affect research

In respiratory medicine most clinical research is undertaken by research registrars (NHS funded) and by senior registrars in training posts at regional centres where the generous staffing ratios allow time for research. Twelve years ago the number of such posts was increased from eight to nearly 40 in order to train new consultants to succeed those who were appointed when the NHS was founded. The process of replacement is now complete. There is a glut of senior registrars and the number of posts is to be reduced. The increase in number of training posts was associated with an increase in research as judged by the number of papers submitted to the British Thoracic Society (also its predecessors) and of respiratory papers submitted to the Medical Research Society. The number is now expected to decrease.

In my view there is still a need for clinically orientated research and hence for an alternative organisational framework to replace that which is being dismantled. One possibility is to create more academic posts but the present academic departments of respiratory medicine in England and Wales do not provide a suitable base (two in London where the amount of lung disease is decreasing at a faster rate than in the country as a whole, one in Cardiff which is closely tied to teaching and one in Nottingham). New departments might be set up in Birmingham, Manchester, Sheffield and/or Newcastle but the heavy cost would make this an expensive option. The alternative is for **NHS/MRC to appoint more career investigators** who undertake research and attract suitable junior doctors for training. My appointment is of this type and Appendix A provides evidence on what can be achieved. Unfortunately the appointment was a consequence of unique circumstances so in the absence of a new initiative, further similar appointments are unlikely.

Training of researchers

In my experience the quality of **research training provided to research registrars by NHS consultants is on average of too low a standard to be useful** (except as an embellishment to a CV). The training can only get worse in future as the present large cohort of new consultants progressively undertake less research themselves. **An essential component of the training should be ability to supervise statistical analyses**. By painful experience I have become convinced that this aspect of a research project cannot be left to a statistician unless he or she is integrated into the research team which is seldom the case.

Funding

Running expenses and technical assistance for most research projects in chest medicine arising within the NHS are funded by drug houses; the research is narrowly based and of limited usefulness. Of the

charitable foundations, that for cystic fibrosis is supporting good work, the Chest, Heart and Stroke Foundation does a little and the British Lung Foundation is beginning to make a worthwhile contribution. MRC support now goes mainly into fundamental research (see recent MRC News for evidence). Given that their funds are limited this is probably sensible but **MRC should have some commitment to clinical research.** In my view it should **also promote research seminars** to identify topics where such research is both needed and feasible with present technology. The US National Institutes for Health do this to perfection and I urge the committee to invite evidence from Dr Claude Lenfant, Head of the Division of Lung Disease, NIH Heart, Lung and Blood Institute, Bethesda, Maryland 20892, USA on this subject.

The role of the NHS in clinical research is ambiguous and this is reflected in the inadequate support given to the chief scientist. The effort devoted to quality control also appears to be inadequate (Appendix B). The NHS funds a few selected, whole-time consultants whose work includes **research sessions based on Postgraduate Centres**. This type of contract promotes clinical/epidemiological research and can retain within the NHS people with enquiring minds which the Service badly needs. In addition, I recommend that jointly with MRC the NHS fund some suitably qualified people to **wholetime research posts in Medical Schools** along the lines of my own appointment. Both these posts and those based on Postgraduate Centres should be located in areas of relatively high morbidity and mortality and not in London where most clinical research is now undertaken.

I could amplify this evidence if to do so would be helpful.

J E Cotes

April 1987

Appendix A

RESPIRATION AND EXERCISE LABORATORY

DEPARTMENTS OF OCCUPATIONAL HEALTH AND HYGIENE AND PHYSIOLOGICAL SCIENCE

University of Newcastle upon Tyne

8TH PROGRESS REPORT MAY 1987

Objective

The laboratory was established in March 1979 to undertake research into respiratory impairment and disablement. The approach has been interdisciplinary and based on the techniques of physiology, epidemiology, thoracic medicine and occupational health.

Review of the past eight years

1. *Occupational epidemiology*. The theme for the laboratory's principal epidemiological study turned out to be the respiratory health of shipyard workers but it could have been any of a number of respiratory hazards affecting local industries. Two major cross-sectional surveys were undertaken and these have now been the subject of nine presentations at scientific meetings. In contrast to other work the studies have demonstrated that shipyard welding fumes consistently damage the lungs. The effect is demonstrable in young men within three years of the start of employment under what are currently approved conditions. The work has called into question the conventional method for analysing epidemiological material and this has delayed publication. A follow-up study is now in progress; it is being complicated by 80 per cent of the men in the two surveys having been made redundant since the initial measurements were made. The reorganisation of the yards has also led to difficulties in getting access to the remainder during working hours. Some men are being seen at Ryhope Hospital, Sunderland by courtesy of Dr N P Keaney. The work is in collaboration with Dr J F Wollaston and the completion date is early 1988.

2. *Growth of the lung at adolescence*. Reference values for normal lung function in adolescence are needed for pre-employment assessments and for extrapolating from such results to those likely to obtain in early adult life. To derive them the lung function of 271 shipyard apprentices has been monitored from their 16th through to their 20th year: the men will be seen again in their 22nd year and hopefully also in their 25th. The material is of high technical quality and the results look interesting but it is still too early to be drawing conclusions.

3. *Methodology in lung function testing*. The laboratory has participated in the European Coal and Steel Community Standardisation Project, making original contributions on transit time analysis of spirograms, the nitrogen method for measuring closing volume and quality control in lung function laboratories (page 5). The latter was in collaboration with the NHS and the report made discouraging reading! The laboratory helped to prepare European reference values and contributed to the report "Standardised Lung Function Testing". In collaboration with the American Thoracic Society the implication of alternative methods for

calculating breathholding time during measurement of the transfer factor for the lung has been investigated. Work on the effects of ambient temperature on lung function is in progress.

4. *Respiratory health of divers.* Using material from the MRC Decompression Registry (now dispersed) the lung volume of divers has been shown to be affected by their diving exposure, both long term and for individual dives. Following a deep dive the half-time for recovery of vital capacity was approximately one month and recovery of transfer factor took longer. Further research initiatives await decisions on the future of divers' medical examinations in Newcastle.

5. *Exercise testing and physical fitness.* For population studies tests of maximal exercise are often unacceptable whilst submaximal tests are often inaccurate. The laboratory has obtained reference values for maximal oxygen uptake ($n0_2max$) of shipyward workers and has demonstrated that oxygen uptake at a respiratory exchange ratio of unity can be used to predict $n0_2max$. This index is now being used by some cardiologists. Work is in progress on indirect methods for measuring exercise cardiac output: this also has applications in cardiology. In collaboration with the University Department of Physical Education a contribution has been made towards improving the physical fitness of local firebrigadesmen.

6. *Breathlessness on exertion.* From the shipyard surveys quantitative evidence has been obtained on the contributions to breathlessness of smoking, fume exposure, chronic bronchitis, angina, previous chest illness and other features. Negative mental attitudes to the illness and to health generally also contribute. Work undertaken for the European Coal and Steel Community has shown that the negative attitudes are a consequence of the loss of lung function interacting with personality and other factors. Work is in progress on the roles of airflow resistance and hypoxaemia and the effects of diazopam, ethanol and caffeine. The value of different ways of training the diaphragm is also being investigated.

7. *Patients with respiratory impairment.* Under the auspices of the College of Physicians Thoracic Medicine Committee a report was prepared on Disabling Chest Disease: Prevention and Care. Arising from this report respiratory patients from one health district who were receiving invalidity benefit and those throughout the North of England who first received mobility allowances in 1983 were assessed and preliminary reports prepared. This work was done initially in collaboration with Dr S J Pearce. It is in progress. In collaboration with the US National Heart, Lung and Blood Institute and the American Thoracic Society an improved model for the assessment of respiratory disability has been validated. In collaboration with the Pneumoconiosis Medical Panel in Newcastle the contribution to disability of radiographic pleural abnormality due to asbestos has been investigated.

8. *Acromegaly.* Patients with acromegaly in common with divers often have large lungs. In collaboration with Professor Kendall-Taylor and her colleagues a study of the relationship of the lung function to the growth hormone levels is now in progress.

9. *Relationship to lung pathology.* The effects upon lung function of structural changes caused by pneumoconiosis are being investigated jointly with Dr T Ashcroft and Dr J E M Hutchinson. It is hoped to also undertake electron microscopic analyses of lungs of men exposed to antimony, zirconium and tin.

Undergraduate Teaching. The laboratory contributes lectures and practicals to the class teaching in respiration for BSc students in Physiological Sciences. A high priority is given to providing respiratory research projects and the laboratory sponsors one or two invited lectures each year on respiratory topics of current interest. A small contribution is made to the teaching of medical students. Lectures on exercise physiology are given to Arts students taking a physical education option towards a combined honours degree.

Postgraduate Teaching. Lectures have been given for the MSc in occupational hygiene, the FFARCS and the Associateship of the Faculty of Occupational Medicine of the Royal College of Physicians. One BMed Sci degree and two PhDs have been awarded on the basis of work done in the laboratory. One MSc and one PhD student are currently in house and two PhD theses are in preparation. Assistance has been given with MD projects. A new textbook "Work-related Lung Disorders" will be published shortly.

Training physiological measurement technicians. Practical instruction has been given to nine physiological measurement technicians on taking up their appointments at local hospitals. Lecture/demonstrations have been arranged at five hospitals in the Region.

Consultations. The laboratory has been consulted by the DHSS and the Technician Education Council on education and training of non-medical personnel within the NHS. Evidence has been given to the Committee of the Physiological Society on the place of physiologists in the NHS, to the Industrial Injuries Advisory Council, the House of Lords Select Committee on Science and Technology, on Research in the NHS and to several Government Departments on aspects of occupational health. The EEC, American Thoracic Society and US National Heart, Lung and Blood Institute have consulted about assessment of disablement and measurement of transfer factor. The Sports Council and Internal Union of Biological Sciences have consulted about the measurements of physical fitness and work capacity.

Scientific Meetings. The laboratory was responsible for the British Thoracic Society visiting the North-East in 1980 and for the Medical Research Society meeting in the New Medical School in 1985. Invitations to visit Newcastle have been extended to several International Societies and Conferences. Local meetings have been arranged in hospitals in the region. Invited lectures have been given to a number of organisations.

Help from others. In addition to the people and organisations mentioned in the report, help has been received from the two sponsoring University Departments, British Shipbuilders, National Coal Board, Pneumoconiosis Medical Panel, Employment Medical Advisory Service, University Departments of Medicine, Surgery, Child Health, Physical Education and Mathematics, Northern Regional Health Authority, Messrs P K Morgan Limited, MRC Pneumoconiosis Unit, Messrs Boehringer Ingelheim, the SmithKline Foundation, Wellcome Foundation, and other organisations. The Medical Research Council, Health and Safety Executive of Department of Employment, Regional Research Committee and European Coal and Steel Community have kindly provided financial support.

Fundings and its implications for research. Increasingly, expenditure has tended to exceed revenue. This has been due to expenditure on the shipyard surveys exceeding the budget, to new work which could not easily be funded independently being carried by other projects and to contracts being accepted on optimistic terms. We are now living with the consequences. In the short term this is acceptable but in the long term the tight money can only lead to our missing opportunities which present and to less adventurous research.

A difficult time ahead? A ten-year life for the laboratory under present leadership and only soft money for salaries has been offset by enthusiasm and wholehearted commitment to what have been considered to be worthwhile projects. For the past eight years the formula has proved to be very cost-effective. Good research, much of a very practical nature, has been completed, some new people trained and a textbook prepared which will help to instruct others. Now with two years to go there is an urgent need to make decisions for the future. Either an opportunity is created for a transition to new leadership or the research will run down. This would be a pity since in a number of respects the North-East has unusual opportunities for advancing occupational respiratory medicine. The choice is one which the NHS, Medical Research Council and University need to make jointly. A very productive solution is in sight: the opportunity should be taken before it is too late.

Memorandum by the Council of Science and Technology Institutes

1. Introduction

The Council of Science and Technology Institutes Health Care Scientific Advisory Committee welcomes the opportunity of commenting upon priorities in medical research and our main interest will be those areas of scientific research that have a bearing on medical research.

The Council of Science and Technology Institutes (CSTI) was formed in 1969 to coordinate, where possible and necessary, professional scientific policy and effort on a national scale in Britain. Its constituent member bodies are

Institute of Acoustics
*Institute of Biology**
Institute of Ceramics
Institution of Chemical Engineers
*Royal Society of Chemistry**
*Association of Clinical Biochemists**
Institute of Food Science & Technology
Institution of Geologists
*Hospital Physicists' Association**
Institute of Mathematics and its Applications
Institute of Metals
*Royal College of Pathologists**
*Pharmaceutical Society of Great Britain**
*Institute of Physics**

and represent some 150,000 professional scientists and technologists. The Health Care Scientific Advisory Committee comprises representatives from those bodies marked * above and has been in existence since 1981 when it was set up at the request of the Secretary of State for Social Services.

The objective of the Committee is to seek to advance scientific research and development for health purposes and the application of science to the improvement of health care for the benefit of the public in the United Kingdom of Great Britain and Northern Ireland.

Although the Committee itself has not been directly involved in medical research, it has been responsible for the allocation of funding that it was successful in obtaining from institutions within the City of London

to support its "Industrial Research Liaison Unit". This unit organised ten seminars on different topics, which brought together academic researchers and industrialists with the objective of furthering research programmes in a number of health care areas into practical industrial developments. Several large projects evolved and were funded again by the City institutions.

Topics covered in the Seminars included virology, instruments for microbiology, enzymes, molecular biology of yeast, tuberculosis—diagnosis and treatment, cytomegalovirus, and biosensors.

Last year the Committee gave consideration to the question of "Selectivity in research support" and we consider that most of the conclusions to which we came at that time are applicable to medical research. In establishing research priorities we concluded that the following points should be borne in mind:

1.1 Timeliness and promise of all proposals, areas to be given overriding priority, relative expenditure requirements, building on existing reputations of research teams.

1.2 Attempts to define criteria for a "research factor" in allocations of resources tend to recognise past achievements rather than future possibilities. Criteria such as "citation indices", that is number of publications, number of research degrees awarded, expenditure on equipment, all recognise the past rather than future promise and bear little on new specialisms or rare research. These areas appear to depend at least initially for their support and encouragement upon subjective judgements or so-called "peer-review".

Excellence of research is not limited to large institutions nor large departments and it therefore needs to be identified not only by historical content but with judgement of prospects for new proposals (or ideas which may lead to proposals).

1.3 Existing funding of research may provide evidence of success in competition with others. This is especially the case with that from Research Councils and Foundations; but the magnitude of grants does not define the quality of projects in different disciplines.

1.4 Earnings from royalties on patents and licences must surely be taken into account in assessing past performance as can income from consultancies and similar services to industrial companies, institutions and individuals. The amount of time spent by university academic staff working in industrial institutions, or Research Council or Government research units, and their ability to attract researchers into such units, are also factors to be taken into account. They all favour the successful transfer of science and scientists from the universities to points of application. The weighting given to such contributions in criteria adopted could be a powerful and sensitive control mechanism.

1.5 Criteria derived from the above considerations may be of assistance in encouraging developments of new ideas through fundamental research but there are more direct methods to be considered for the encouragement of applied research.

1.6 The criteria used in industry to assess research projects can be relevant for any assessment of distribution of effort and resources. These would include:

(a) Projects with a high chance of success, say 80 per cent or more.

(b) Considerations of potential size of market, or share of world-market, if successful.

(c) Ability to satisfy customer requirements or serve the public interest in benefit terms or in disaster-avoidance terms.

1.7 We accept that whilst it is possible to list some of the aspects to be noted in formulating criteria, it is much more difficult to express such criteria in a formula for arithmetic application in an "allocation of resources" procedure. However, we suggest that it is worth attempting.

2.0 *Specific questions posed by Sub-Committee*

The following paragraphs deal in order with the questions posed.

2.1 (Question a) Research in terms of National Health priorities appears to be influenced more by the aggressiveness and brilliance of the research programme available than by the needs of the NHS or the health needs of the nation. Large sums appear to be devoted to elaborate diagnostic procedures and sophisticated surgical techniques, but less are available for prevention, cure and care.

Due to the very large charity funding of medical research, many priorities are determined by public opinion or public awareness, for example on cancer, AIDS, and not necessarily by the particular needs of the NHS.

Priorities also appear to be often set for "doing something" rather than "finding out about something", which may well have better long-term benefits relevant to prevention especially and as the basis for treatment.

2.2 (Question b) We are not convinced that the present balance between different branches of research is right. We are concerned that publicised earmarking of particular areas (recent examples include mental health and care of the elderly and chronically sick) can have the effect of encouraging poor research, by encouraging into those areas researchers who have little real expertise or interest in the area, apart from the funding. Poor researchers in the earmarked areas can be awarded funds rather than good quality researchers in other areas. Research priorities in the areas mentioned above seem to have no definable long term goals for the care and treatment of the mentally ill and the aged. We would suggest that greater priority should be accorded to programmes designed to find fresh answers to such fundamental problems in the relevant scientific fields, for example, epidemiological research where this country's resources, compared with overseas, are poor in quantity, and sometimes also in quality.

We are concerned also that there appears to be a lack of research in areas where the population has an interest and a need for guidance, to avoid being misled by pronouncements by "experts" of dubious authority. We would cite, for example, that there is a paucity of genuine nutritional research. The enormous developments that have taken place in the endocrinology of the gastro-intestinal tract and the ability of different nutrients to stimulate the release of various hormones from the gastro-intestinal tract have received little attention despite their obvious relevance to nutrition and the aetiology of nutritional disorders. Food processing has a profound effect on the way the nutrients contained within the food are handled by the gastro-intestinal tract and consequently upon the hormonal responses. This area of work has generally not been considered as either endocrinology or nutrition and is consequently one of the "Cinderella subjects" and so falls within a grey ill-defined area for research funding.

We consider that far too little attention is paid to preventive medicine compared with acute medicine. An important area is that of all aspects of health screening. With regard to breast screening, we would suggest that the priority should now be with training of NHS personnel rather than new research. On the other hand, little progress has been made on screening techniques for heart disease.

Whilst we are reluctant to suggest programmes which should be cut back, in times of limited resources less priority could be given to the more esoteric biochemical studies compared with the more applied studies mentioned above. Likewise those programmes leading to high-cost physical devices should have lower priority compared with low-cost or mass-screening diagnostic methods.

2.3 (Question c) We would suggest that whilst there have been changes to accommodate new technology there will be a greater need to take into account the change in age profile of the UK population with the needs of the elderly. Areas for future work could include:

— the biology and pathology of ageing

— other factors in the ageing process

— the role of nutrition in the prevention of disease in the elderly with particular reference to diseases of the nervous system and skeleton

— how care in the community is best administered and the needs of the supporting family

— the extent to which the use of drugs in old people is responsible for morbidity

— the needs for care and rehabilitation of cancer patients

2.4 (Question d) Many medical researchers adopt research policies which will allow them to approach more than one grant-giving body. To generalise, hospital based research tends to use charities or commercial funding, and the "basic sciences" medical school groups go to the Research Councils. In a period where the Research Councils are suffering from reduced cash flow this will affect some groups more than others.

The Medical Research Council (MRC) and the Science and Engineering Research Council (SERC) and other bodies seem to prefer to fund projects only if new science is involved. The gaps between Committees and Boards of the Research Councils are still wide and it is easy to fall into the gaps.

There is no obvious source of funding of medical equipment development. Health Authorities can fund through small Locally Organised Research (LOR) grants but the emphasis is on young research workers (rightly) and this may not fit the situation. Industry might provide sponsorship in return for manufacturing rights but this can be too restrictive at an early stage. New arrangements for funding the development of medical equipment based on existing science appears necessary. Such a development would be in keeping with a suggestion in the recent ACARD Report that there should be close links between NHS staff and manufacturers. This could be facilitated if the DHSS or Health Regions had a grant scheme for solution of problems identified by staff as part of their work. We recognise the need for evaluation of cost effectiveness of new technology.

The NHS provides a valuable proving ground for products before they go on to the export market. This needs more formal recognition.

2.5 (Question e) We are not aware of problems with the dissemination of the results of research.

2.6 (Question f) There appears to us to be reasonable co-operation between the SERC and MRC. We are less sure of the level of cooperation that exists between the Research Councils and the Charitable Foundations.

It is not possible to define "unnecessary duplication of research effort". Competitive research in the same area can be productive and challenging and also "verification" research is essential up to a point. It would be up to the particular grant-giving body, charity or department to decide on the originality of the research it was supporting. An element of confirmatory research may be acceptable; we might further suggest that competition should be encouraged rather than centres of excellence.

2.7 (Question g) This can only apply to research which is specifically aimed at the areas of patient care or health education, for example bone marrow transplant *v* chemotherapy in leukaemia. Specific aspects of health education need very long term research which to date neither the Government or the Research Councils have been keen to finance. The emphasis to date has been more on rapid results. Care should be distinguished, in some cases, from treatment. There is a need for increased flexibility in the delivery of patient care so that changes can be made and the results of research implemented. Barriers to such implementation should be identified. Resistance to change can sometimes be traced to inadequate education programmes and lack of sufficient updating or continuing education.

There is too great a gulf between the attitude of mind and the status of the medical researcher on the one hand, and on the other that of nurses or paramedical staff who are working with the patients. This again arises from incomplete education and lack of updating which spans several specialities.

2.8 (Question h) It is our experience that medical researchers are not trained as such. Medical undergraduate training, particularly that incorporating an intercalated research year, if successful should give some of its graduates the desire to solve problems and answer questions. This is true of other scientific graduates as well. What they then need is access to subject matter, technological training together with humanitarian aspects and then the opportunity to integrate this work with their general professional career. Medical research by clinically trained staff would benefit immensely from a more comprehensive research programme such as exists in the physical sciences.

The question should be extended to include nursing and paramedical research workers. There is a real need for training in research of suitably qualified nurses.

Considerable attention has been drawn to the need for nursing research but there is a dearth of people who are qualified to direct and carry out such research. In addition, there is a real shortage of suitably qualified people to fill high level academic posts in nursing who are interested in the actual practice of nursing rather than the social or management aspects of the profession. The same comment applies to the paramedical professions.

2.9 (Question i) Serious consideration should be given to the structure of public grant funding organisations especially in their long term commitments to research establishments (including their own). Most public research money should go for research, not for the maintenance of administrative structures or for erection and maintenance of buildings. If the latter are to be provided it should be on some joint basis with universities or other institutions. That research money is used for, for example, landscaping or upkeep of buildings is clearly a luxury if—as is currently so—there is a reduction on new grants. In this respect we think the House of Lords Science and Technology Committee certainly could make recommendations as to the internal management strategies of the Research Councils.

We recommend that consideration should be given to setting up a Coordinating Committee involving the Research Councils, the other funding bodies, and the DHSS. This Committee would be required to give particular attention to the mechanism whereby the results of pure research influence patient care and health education. It must also devise a mechanism to allocate adequate funds for applied research, for example the nutritional research mentioned under 2.2 and for equipment development based on existing science, as discussed under 2.4.

Our experience with the "Industrial Research Liaison Unit" of this Committee (see Introduction) has shown that there is potential within the City of London financial and other institutions for funding well-prepared research projects that have commercial prospects, both within Britain and in the export market. We therefore recommend that the Co-ordinating Committee we propose above should comprise a similar Unit, and be given official (Government) support to "help in the maximum exploitation of British potential to service the scientific aspects of health care requirements in the UK".

Such a Committee would need a strong input from the Health Districts and from professions directly involved with patients. It should not in our opinion be dominated by representatives of the Medical Schools.

2.10 *Concluding Remarks*

Medical research of course is not a special case and basic scientific research whether medical, environmental or scientific will be productive in medicine as well as other fields. We suggest the Government should have a policy of promoting basic research especially if carried out in applied environments, and leave specialised research perhaps to the charities who are associated with these specific areas. The NHS's role in research should be principally in long term areas such as disease prevention, the elucidation of disease mechanisms, and the relations between environmental/occupational factors and disease. It should separately promote research in clinical care but must be clear about separating such research policies.

May 1987

Letter from Professor M E J Curzon, University of Leeds

A copy of your letter to Mr Davies of the General Dental Council has been passed to me from my secretary while I am carrying out dental research here in the USA. I am therefore replying directly to you as I will not return to my office until 7 May.

I am presently Professor of Child Dental Health at the University of Leeds and have held that Chair since 1983. Prior to my present appointment I was Chairman of Oral Biology, Eastman Dental Center, Rochester, New York. In the latter institution I supervised a research department and in a ten year period gained research grants and contracts totalling $2.2 million. This funding was from US Navy, National Institute of Dental Research, industry and a number of foundations.

Since arriving in Leeds my department has had £151,000 of support from Yorkshire Regional Health Authority, Spastics Foundation and Industry. Grants are pending review by the Medical Research Council and the Ministry of Agriculture, Fisheries and Food.

To specifically answer the points in your letter:

(a) For dental research there appears to be no body to set priorities. Unlike other countries the United Kingdom does not have a body, such as the National Institute of Dental Research in the USA, to decide where dental research efforts should be guided. Such a body is now needed. It is insufficient for dental research to be left under the umbrella of Medical Research where it has to compete with much wider medical problems.

(b) Priorities need changing as patterns of dental disease change. Thus there are still groups of children with high levels of disease that need special care. Research needs focusing on why this sub group of the population is not receiving, or requesting, good care. Other areas of attention are root dental decay in the older (35 years+) population, periodontal disease and the psychology of patients' attitudes to dental care.

(c) Priorities for dental research are slow to change in the United Kingdom. One aspect of research that is not carried out by the MRC is "contract research" where specific topics are advertised for researchers to "bid for". This approach focuses attention on lines of needed research.

(d) Institutions are of themselves people and therefore the priorities will be those perceived by the individuals who will have their biases. In universities the priorities will be derived from clinical experience but also by the need to preserve a team of researchers with expertise. Foundations will be guided by their specific interest and industry by the possibilities of marketable products.

(e) Results of research are adequately disseminated through professional journals.

(f) Duplication is inevitable and indeed desirable to ensure that research findings are valid and reproducible.

(g) In dentistry certainly yes. The tremendous improvements in dental care have been due to the research of the past 50 years.

(h) This area needs a great deal of attention. In the United Kingdom the system does not encourage dental (or medical) researchers. I have to compare the United Kingdom with the USA system. In the latter there are many fellowships often paying up to $20,000 per year for five years to encourage young dentists to train for a specialty and earn a PhD at the same time. They then become active clinical researchers.

In the United Kingdom the young dental graduate who wishes to pursue an academic career is forced to go into hospital clinical training first to satisfy the requirements of the Royal Colleges. After the five to six years of hospital work these dentists are not attracted to, or encouraged to undertake, research. The system almost actively discourages people.

(i) For dental research, and I suspect for other areas such as eyes etc as well, there needs to be a reorganisation of funding to place specific sums of research money devoted to specific disciplines.

My own calculations indicate there is approximately £1.6 million per year for dental research. This derives from the MRC, SERC, DHSS, MAFF etc. In no case is any money earmarked for dental research. By contrast the National Institute for Dental Research (USA) has $116 million (FY 1986–87), which is only spent on dental research. The contrast is striking and becomes only too evident when one visits Dental Schools in the USA and compares the activity and enthusiasm with that in schools in the United Kingdom.

In summary my experiences have shown that the dental research in the United Kingdom is of high standard but that there is very little of it. The incentives in the United Kingdom are few and the obstructions great. There is perilously little research money to develop and train people in Great Britain. Fellowships in dental research are scarce, low paying and very difficult to get. We must place a great deal of effort and money into the young researcher.

I would be only too pleased to meet the Committee or to expand on the above on my return to England.

M E J Curzon

Letter from the Cystic Fibrosis Research Trust

Further to my letter of 23 April, I have now had an opportunity of discussing your points with my medically qualified colleagues and if it is not too late, I would like to make the following comments on your letter of 3 March.

(c) We think the priorities in Medical Research adapt reasonably well to changing incidences of disease. An excellent and recent example of this is the response to AIDS.

(d) There is widespread concern that more and more research has to be funded by commercial interests, but on the other hand commercial support often enables useful basic research to be done. The answer would not be to further limit commercially-supported research, but in the absence of increased funding from public and charitable bodies the trend is worrying.

(f) Unnecessary duplication of research effort is avoided in practice by a shortage of funds. The calibre of the Medical Advisory Committee ensures that the funds are not wasted in this way.

(g) Research is not reflected as it should be in actual improvements in patient care or health education. There is a lot of inertia within the NHS resulting from the innate conservatism of the doctors and the cumbersome NHS administration. Innovations nearly always involve extra cost, and administrators talk about "creeping development", meaning that they will often veto a project in the early stages because they can see financial implications looming up. Advice given to Health Authorities at all levels is not necessarily balanced, and there is no doubt that certain specialities carry more weight than others within medical advisory committees.

(h) Career structure with security of tenure would do wonders for the training of medical researchers. So many people with genuine talent go out of research because they have no job security.

(i) We think it would help if the ruling about submissions to the MRC and the DHSS were scrapped. At present, if a project is submitted to either of these bodies it automatically becomes ineligible for the other, even though it may have been inappropriately directed in the first place.

We would like to say that many applications to the Trust have marginal relevance to CF and this presumably reflects the difficulty applicants have in obtaining funds from elsewhere. They are often very good projects but have to be rejected by the Trust because they are tangential to our main objectives. Some of the Trust's research projects, for example the screening programme in Wales and the West Midlands, should perhaps be funded by the NHS as they are directly related to "the health needs of the nation".

I am sorry that this reply has taken so long to send, but I sincerely hope that the Sub-Committee will be able to take our comments into account.

Barbara Bentley (Mrs)
Director

May 1987

Letter from Professor J A Davis, Department of Paediatrics, University of Cambridge Clinical School

Professor Clark has passed on to me via the Federation of Clinical Professors your letter of March 3 asking a number of questions about Medical Research with the suggestion that those concerned should write to you directly giving their answers. Mine are as follows:

(a) No priorities are or should be set. Research workers pursue topics that are of interest and concern to them and obtain the necessary funds if they make out a good case to those who deploy them.

(b) No one can answer this question sensibly; science being the art of the possible rather than the desirable and each of us having his own justifiable priorities. Any control there is is exercised by grant giving bodies. You would not expect me as a paediatrician for instance to give high priority to questions that exercise my geriatric colleagues.

(c) Priorities inevitably adapt themselves to the changing incidence of disease, since those engaged in clinical research, at any rate, cannot do so without access to relevant material. For example, our research in Cambridge in the Paediatric Department largely concerns newborn babies because we have a high birth-rate and a low incidence of disease in childhood.

(d) Charities such as the Cystic Fibrosis Trust are set up to fund research into particular conditions; others have a more general brief with some concerned about fundamentals, such as the MRC, and others about problems such as Action Research for the Crippled Child. Each has its own priorities and each tries to persuade the public by one route or another to fund the kind of research it is concerned with.

(e) The straight answer is "yes": there are more than enough medical journals and perhaps the problem is getting them all read in a critical way. But this is a naive question. The whole point of science is that results can be duplicated and they must be if the truth is to be established.

(g) The answer to this question lies all around us with the disappearance of many diseases that caused a high mortality and morbidity when I was a young man. As regards health education, it must be obvious that the nation is giving up smoking as a result.

(h) Even if we knew what changes in priorities were desirable there would be no way of achieving them without stultification of research effort. This question again portrays an almost total lack of understanding of how research works.

(i) What is needed in order to increase the quality, quantity and application of research are larger funds (it is obscene, and I speak advisably, that the MRC has run out of money to fund what it considers to be valuable research while at the same time the Government is giving away as it puts it £4 billion).

I should add that good research depends on the recruitment of able, imaginative and gifted young men and women who are motivated largely by idealism and curiosity in the first instance, though they have to be prudent in pursuing their career for the sake of their families. But talent is of no use without training and this is arduous—especially when they also have to learn how to practise good medicine. At the moment recruitment is suffering and it will continue to do so with increasing momentum without a change in policy.

John A Davis
Professor of Paediatrics

March 1987

Memorandum by the Department of Education and Science

1. This note is in response to the request on behalf of Sub-Committee II of the Select Committee on Science and Technology in connection with its remit to consider priorities in medical research, with particular reference to the needs of the National Health Service.

DES FUNDED MEDICAL RESEARCH

2. There are five Research Councils funded through the Department of Education and Science (DES) Science Budget: the Science and Engineering Research Council, the Medical Research Council, the Natural Environment Research Council, the Agricultural and Food Research Council and the Economic and Social Research Council. The work of the Medical Research Council (MRC), whose grant in aid was £128 million in 1985–87, is most relevant to this enquiry.

3. Under the usual dual support arrangement, universities, including those with medical schools, support research from the grants they receive via the University Grants Committee (UGC). The Government does

not seek to influence directly or in detail the scale and nature of this research activity. Accordingly this note concentrates on MRC research.

OBJECTIVES FOR DES FUNDED MEDICAL RESEARCH

4. The aims of DES science policy generally are to maintain and enhance the strength and quality of the science base in higher education and the Research Councils and thereby to strengthen the knowledge and skills of the UK in science and technology and improve the efficiency, competitiveness and innovatve capacity of the UK economy. Consonant with this, the objectives are to encourage:

— greater concentration and selectivity of research activities;

— closer and better working with industry and commerce;

— more funding from private sector sources;

— better management leading to greater value for money;

— increased flexibility enabling faster response to new scientific opportunities;

— continuing review of the balance between international and national scientific endeavours.

5. In the formulation and discharge of the Government's policies for the science base and in the allocation of the Science Budget the Secretary of State for Education and Science is advised by the Advisory Board for the Research Councils. The Board is responsible for advising on priorities for the Science Budget overall, of which the grant in aid for the MRC amounts to about 20 per cent.

6. As the main Government funded body in the UK concerned with biomedical research, the MRC has to respond to the aims and objectives of the Health Departments—the Department of Health and Social Security (DHSS) and the Scottish Home and Health Department (SHHD)—as well as those of DES. In 1973 in response to the Rothschild Report—"Framework for Government Research and Development" Cmnd 4814—nearly 20 per cent of MRC science vote funds was transferred to the Health Departments. No conditions were placed on the use of these "Rothschild funds" but the expectation was that they would be used to commission applied research work from the MRC. In 1981 MRC and DHSS agreed on a Concordat. This provided for, inter alia, the return of the Rothschild funds to the science vote and a strengthening of the Health Departments' influence on MRC's research programme.

SPECIFIC QUESTIONS ASKED BY THE SUB-COMMITTEE

a. *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

7. In general the MRC determines priorities for the use of their grant in aid, taking account of DES aims and objectives for science policy, and do not expect or receive direction as to how these monies should be spent. The Concordat provides a mechanism for Health Departments priorities to influence MRC and ensure that the Council's work reflects the needs of the National Health Service and the health needs of the nation. Also, the Chief Medical Officers of DHSS and SHHD and the Chief Scientist of DHSS are members of the MRC.

b. *Is the present balance between the different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

8. As the Select Committee's previous report (House of Lords Select Committee on Science and Technology "Civil Research and Development" 1st Report Session 1986–87, HL 20) recognised, the process of setting priorities for medical research must take account of the need to ensure that there is a healthy foundation of basic science and assured programmes of strategic research. The DES view is that the present balance between MRC's basic, strategic and applied biomedical research is about right. Decisions about which programmes to cut back where resources are limited, or expand if resources are increased, need to take account of the wider aims and objectives for the science base as well as the needs of the nation's health.

c. *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

9. Priorities for MRC research are constantly adapting to changing incidences of disease, changing population structures and new technology. In addition the Government has given high priority to research on AIDS and MRC has been given an extra £17.5 million, over the next three years, earmarked for this purpose.

d. *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

10. Clearly priorities in medical research are influenced by the institutions through which research is funded; commercial bodies are concerned with funding research which is likely to yield commercial products and charitable bodies fund research closely linked to their charitable objects. The role of publicly funded research is primarily to maintain the research base and to complement research funded from private sources.

e. *Are the results of research adequately disseminated?*
f. *How is unnecessary duplication of research effort avoided?*
g. *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

11. As the objectives for DES funded research make clear, the Department is concerned firstly to encourage closer and better relationships between scientists and those who use the results of their research and secondly to promote better management, including avoiding unnecessary duplication of research effort.

h. *What changes in priorities in the training of medical researchers are needed?*

12. The Department has at present no changes to propose in priorities in the training of medical researchers. It regards the MRC as responsible for determining particular priorities in respect of the training it supports.

i. *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

13. Changes in organisation and funding can prove expensive and disruptive. The present organisation and funding of public sector biomedical research is generally effective and efficient. Improvements are, of course, possible and the DES is working, where appropriate, with the MRC and the UGC to achieve them. The Department believes that the best way forward is evolutionary change within the present system rather than radical changes in either organisation or funding.

14. The Department's response to the question of how far the problems identified in the Select Committee's previous report apply in the field of medical research must await the Government's response to that report.

Letter from the Department of Health and Social Security, Northern Ireland

Thank you for your letter of 3 March 1987 addressed to Dr R J Weir. As Dr Weir has retired I am replying to your queries.

The Department of Health and Social Services in Northern Ireland has a small budget for funding medical, social services and health care research. In 1986–87 the total expenditure amounted to £447,000. The money is divided into two parts, one for support of clinical research (£318,000) and the remainder for non-clinical work (£129,000).

The greater part of the clinical research money is devoted to the appointment of Research Fellows, each appointment being for one year. The primary aim of the Research Fellowships is to introduce mainly young medical graduates to the field of research and to research methods. The remaining small amount of clinical research money is used in the form of grants to provide equipment and consumables to small worthwhile research projects which in some cases may already be ongoing.

In appointing Research Fellows and allocating research grants the Department is advised by the Clinical Research Awards Advisory Committee (CRAAC), a Committee of senior academic staff drawn from two local universities.

The non-clinical research funds (£125,000) are used by the Department of Health and Social Services to commission research by outside bodies into issues which are essentially service-orientated. The allocation of these funds is decided each year by the Departmental Research Group which is chaired by an Under-Secretary and made up of Departmental Professional Advisers (Medical, Nursing and Social Work) and administrative colleagues from interested Divisions.

As an integral part of the United Kingdom local researchers in the health and personal social services also apply to MRC, ESRC, SERC and other local and national charity organisations dealing with medical and related matters.

In response to your specific queries the Department offers the following views—

(a) Broad priorities for medical research are set in the context of nationally perceived problems. For example the emergence of the disease AIDS has created the need for the diversion of much research effort and funds into this area. The annual meeting between the Medical Research Council and the Chief Medical Officers of the four home countries is a useful forum where the needs of the Health Departments for research in specific health fields can be transmitted to the major medical research awarding Council.

(b) We would not wish to comment on the present balance between different branches of research. However if cutbacks are required we would suggest that these should be done on a cost-benefit analysis basis with research into problems affecting smaller numbers of the population receiving a lower priority: in essence the greatest good for the greatest number.

(c) The rapid and massive shift in research interest and funding in response to the emergence of AIDS is proof indeed that medical research has adapted flexibly to new pressures.

(d) Northern Ireland is unfortunately, by virtue of both its size and its geographical position, on the periphery of the major fund awarding bodies in the United Kingdom. We are however fortunate in that local charities are generously supported by the population and they in turn support medical research. Nevertheless charities do tend to be rather unifocal in making awards for research.

(e) All awards by both CRAAC and DRG carry with them a requirement to report back to the awarding body; in the former case there is also a strong encouragement to publish results. I attach for information a copy of the activity and publications which have arisen from the MRC funded "MONICA" project in Northern Ireland. [*Not printed.*]

(f) Before making awards, panels tend to check the literature and there is often cross-membership with other medical grant awarding bodies in Northern Ireland.

(g) We have no doubt that research results in increased understanding of basic disease processes and that the new understanding improves the likelihood of better treatment or cure being found by further work. Service orientated research has in the past produced very definite improvements in both patient care and in the efficiency and effectiveness of the health and personal social services.

(h) The stiff competition for places in the local medical school has already ensured a supply of academically able young graduates. There is a most pressing need to make careers in academic medicine more attractive by improving the funding of research and making careers in this aspect of medicine at least as attractive remuneratively as mainstream medicine. More small research projects should be available to senior medical students and for medical postgraduates undertaking higher professional training. These projects need not be costly but could involve retrospective or observational studies of current NHS work and work processes.

(i) Changes may be required to facilitate (h) above.

I trust that this information will be of use to your committee and if there are any points requiring clarification please do not hesitate to approach this Department.

I would point out that following Dr R J Weir's retirement he has been replaced as CMO by Dr J F McKenna.

W D Thornton
Deputy Chief Medical Officer

April 1987

Memorandum by the Department of Trade and Industry

INTRODUCTION

1. The Committee have indicated that their enquiry will extend beyond basic and clinical research to other areas, including research and development (R&D) in the pharmaceutical and medical equipment industries. This note describes the role of the Department of Trade and Industry ("the Department") in supporting R&D in those industries.

MEDICAL EQUIPMENT

2. The report of the Advisory Council for Applied Research and Development (ACARD) on medical equipment, published in 1986, provided a comprehensive review of the structure and performance of the UK medical equipment industry. Officials from the Department contributed to the report's preparation. Some of the ACARD recommendations were addressed directly to the Department. These recommendations and the Government's response to them are set out in Annex A to this memorandum.

Sponsorship

3. The Department's interest covers certain parts of the medical equipment industry, mainly those involving the more sophisticated diagnostic, therapeutic and clinical equipment and more particularly equipment with a significant electronics content. The product categories concerned are listed in Annex B. The remaining areas are covered by the Department of Health and Social Security (DHSS).

4. For manufacturers of the type of equipment covered by the Department, innovation plays an important part in improving competitiveness. The Department assists the innovation process through the support it provides for R&D. Such support was described in detail in the Department's written evidence to the Select Committee's previous enquiry into civil R&D.

Technological advances

5. It is essential for the Department to keep abreast of technological developments in the medical equipment field, to help in identifying those advances and products which are more likely to succeed in world markets. Decisions on the direction and balance of the Department's support are made in the light of this information. Sources of information include the DHSS with which the Department keeps in close touch, the relevant research councils and the medical equipment manufacturing industry.

6. Technological advances in the sectors covered by the Department are stimulated by the market's requirement for more precise, more reliable, more cost-effective means of diagnosis and therapy as well as the need for techniques and instruments to be more acceptable to the patient.

7. Recent years have seen the increasing use of micro-electronics and particularly micro-processors and computers in the more sophisticated types of medical equipment. The Department has played a part in encouraging this trend through its support schemes.

8. Advances in the technology of sophisticated sensors, including fibre-optic and micro-electronic sensors, offer the prospect of significant improvements in patient monitoring and in diagnosis. Such sensors should in time provide faster, less intrusive and cheaper means of measuring clinical parameters. They are making it possible for laboratory measurements to be made by less elaborate instruments and, by the same token, making it more practicable for such arrangements to be made outside laboratories, by general practitioners for example.

9. Finally it is widely accepted that Information Technology will have a rising contribution to make across a wide range of management activities as well as health care. Health care services are likely to rely increasingly on more integrated systems, involving Information Technology, in almost every area including diagnosis, therapy, data storage, retrieval and processing, and medical laboratories. This prospect has significant implications for medical equipment which increasingly will be used as part of such systems rather than as stand alone units. It will be important for the industry to ensure that its products are suitable for incorporation in such systems. The Department is taking this into account in its R&D support activities.

Support measures

10. Assistance is given under the Support For Innovation (SFI) scheme. Essentially this involves making a contribution of up to 25 per cent of any single firm's R&D cost for qualifying product developments. The proportion can rise to 50 per cent when three or more firms collaborate in pre-competitive research projects.

11. The Department has also stimulated the introduction of newly-developed equipment through the Pre-Production Order (PPO) scheme. This involves encouraging potential users of such equipment to test it for a certain period at the end of which they can purchase it or return it to the supplier. Since April 1985, following a review of the Department's support activities, the scheme has been available only for projects involving public sector users or overseas users.

12. Select Committee members will be aware of the LINK initiative announced by the Prime Minister at the end of 1986. The Department together with the SERC and the DHSS is currently looking at the possibility of setting up LINK programmes as a means of stimulating advances in relevant technologies, such as sensors, through collaborative R&D between firms, universities and other appropriate institutions.

13. In the years 1982 to 1986 inclusive the Department committed about £13.97 million to supporting medical equipment R&D. Over the same period, support was provided for Pre-Production Orders covering equipment costing a total of around £5.58 million. Annex B provides a breakdown of the figures.

14. Two examples of supported projects which have resulted in products which have proved commercially successful in UK and export markets are:

(a) A high energy linear accelerator (produced by MEL of Crawley) which is used for the radiation therapy of tumours.

(b) A mobile X-ray system (produced by Picker International of Wembley) which can be taken to the patient.

Project appraisal

15. To qualify for support, projects must satisfy the SFI criteria. These essentially concern technical, commercial and financial viability, and additionality.

16. All applications for support are considered by a Divisional appraisal committee whose membership comprises representatives from DTI, DHSS, the Clinical Research Centre, Laboratory of the Government Chemist, National Physical Laboratory, the Atomic Energy Research Establishment (AERE) at Harwell and the Scientific Instruments Research Association. Projects costing over £500 thousand are subject to a more extensive appraisal. A less rigorous appraisal procedure is applied to applications from small firms.

Coordination

17. Public sector bodies with an interest in medical equipment R&D are kept informed of DTI's activities through their membership of the Divisional appraisal committee. There are in addition frequent informal contacts with the DHSS on matters of common interest.

18. Until the latter part of 1986 the more important issues concerning R&D in medical equipment were discussed at about six-monthly intervals in a DTI/DHSS liaison committee involving senior officials of both Departments. This committee's functions were taken over by a new coordinating group comprising senior officials from the DTI, DHSS, SERC and the MRC. This group was formed in response to one of ACARD's recommendations. The group meets quarterly. Its functions are to keep participants informed of one another's activities and to identify areas calling for greater effort, particularly those where joint action by two or more participants offers advantages. This group has an important part to play in advising on the balance and thrust of R&D support for medical equipment.

PHARMACEUTICALS

19. The Department sponsors the chemical industry, which supplies intermediates and bulk active ingredients to the pharmaceutical industry, and thus has an interest in the chemical technologies used in the manufacture of medicines. The pharmaceutical industry itself is sponsored by DHSS.

20. The Department's SFI scheme is in principle available to support any project which meets the scheme's criteria. However, it has not so far been the practice to support projects by single pharmaceutical companies. This is because the Pharmaceutical Price Regulations Scheme (PPRS) which governs the return on capital which companies may earn from supplies to the National Health Service makes an allowance for R&D expenditure. Support for individual projects would cut across the competitive balance between companies which the PPRS is intended to safeguard.

21. Support has been given in the past and could be given in the future to a chemical company which sees a way to produce an intermediate or an out-of-patent active ingredient more cheaply.

BIOTECHNOLOGY

22. The Department has the lead role in Government in fostering the development and adoption by industry of biotechnology, which is defined as the application of biological organisms, systems or processes to manufacturing or service industries. Biotechnology has a long history, but recent research advances in molecular biology are of key importance for the health care sector in diagnosis and treatment.

23. In diagnostics (including biosensors) assistance has been given to 17 innovative projects in 14 companies with a total commitment of £4.8 million. A Biosensor Materials Club has been established with assistance from the Department at the Atomic Energy Research Establishment (AERE) at Harwell, with ten industrial members.

24. In the pharmaceutical applications of biotechnology, the Department's strategy is to encourage liaison between companies and academic researchers in universities and institutes. Industrial expertise may thus influence the direction of academic research in biotechnology, with increased prospects that industry will pull forward exploitable innovation. The Department co-sponsors with industry pre-competitive collaborative work with academic researchers in enabling technologies (genetics, synthetic peptides for vaccines). The assistance committed amounts to £3.2 million.

25. There is also support of innovation by research-based companies in the medical sector (for example Celltech) and of programmes at the Public Health Laboratory Service Centre for Applied Microbiology and Research (CAMR) in protein engineering and fermentation technology, at AERE Harwell and Warren Spring Laboratory (WSL) in separation technology, at CAMR and WSL in industrial biosafety, at the National Engineering laboratory in bioreactor design and at the Laboratory of the Government Chemist

in dental cements and prostheses. All of these programmes seek to develop enabling technology relevant to medical research and to transfer it to companies. There is also close liaison with the research councils.

Department of Trade and Industry

May 1987

Annex A

RECOMMENDATIONS OF THE ACARD REPORT ON MEDICAL EQUIPMENT ADDRESSED DIRECTLY TO DTI, AND THE GOVERNMENT'S RESPONSES

1. A mechanism should be set up to coordinate the programmes of DHSS, DTI and SERC in the medical equipment field. This mechanism should involve participation by MRC and industry.

DHSS and the Medical Research Council (MRC) are already collaborating in a major exercise in the assessment of magnetic resonance imaging. Discussions will be held on the extent of the MRC's future involvement in the assessment of new medical equipment. A joint review of the Science and Engineering Research Council's (SERC) current programme in medical engineering is also under consideration. It is noted that the European Medical Research Councils have recently taken up the question of medical technology assessment. The Government agrees that, regardless of the amount spent by the various bodies, more will be achieved if their efforts are properly coordinated. A coordinating group involving DHSS, DTI, the MRC and SERC has been formed and has started work.

2. DTI should give wider publicity to market reports from British Posts overseas and to the other help to exporters which Posts can provide.

Much effort is already devoted to publicising the market reports disseminated through the Export Intelligence Service, to which anyone may subscribe. Some major trade associations do so and pass on information to their members. Other BOTB (British Overseas Trade Board) services are also advertised substantially. DTI will nevertheless pursue the recommendation with the relevant interests.

3. A single Branch within DTI should be given coordinating responsibility for all those sponsorship and support activities towards the medical equipment industry that fall to DTI, including responsibility for liaison with DHSS and SERC on matters relating to the industry.

The Government accepts the recommendation, and DTI's Electronics Applications Division will take on the coordinating role.

4. A joint group from industry, Customs and Excise and DTI should be set up to produce a more helpful classification scheme for the Government statistics relating to the industry.

Major changes in the European Community classification of imports and exports based on an extensively revised international nomenclature and providing more detailed information are due to come into effect in January 1988. A revised nomenclature for production statistics is also under consideration. In this context the Government will examine ways in which statistics relating to the industry could be improved, taking account of its needs and the constraints that apply (for example nomenclature rules and commercial confidentiality); it is however noted that in the past few years only one application has been made by the medical equipment industry for more detailed statistics.

Annex B

ANALYSIS OF SUPPORT OFFERED TOWARDS MEDICAL EQUIPMENT DEVELOPMENTS 1982–1986 INCLUSIVE

	Grants offered		*Value of PPO equipment subject to support*	
	No of projects	*Value £'000*	*No of projects*	*Value £'000*
1. Medical Imaging (all techniques including components etc.)	20	4,330	11	4,900
2. Electromedical equipment (includes anesthetic machines, diagnosis, lasers, therapeutics)	39	4,680	4	120
3. Dental (some related instrumentation)	2	50		
4. Equipment for the disabled and elderly (includes appliances, aids, audiology)	6	250		
5. Pathology Laboratory (includes instruments and equipment, diagnostic kits)	25	2,940	3	560
6. Miscellaneous (includes optics, catheters)	10	970		
7. Sensors	9	753		
Totals	111	13,973	18	5,580

Notes:

i. The above categories are not always mutually exclusive; for example some sensor projects in (7) could be included in pathology laboratory equipment (5).

ii. The DTI also supports a wide range of sensors research some of which may have medical applications, and laboratory instruments developments which may also have some medical applications. These are not included in the figures.

Memorandum by J Roger Detels, University of California, Los Angeles

The Epidemic of Acquired Immune Deficiency Disease in the United States

The first cases of Acquired Immune Deficiency Disease were identified in Los Angeles, San Francisco and New York in late 1980. In the first years of the epidemic the number of cases doubled every year. In recent years the rate of increase has slowed. In 1987 there were 50 per cent more cases reported than in 1986. As of December 7, 1987 there have been a total of 47,436 cases reported to the United States Centers for Disease Control.

The distribution of cases by risk group has not changed since the first cases were identified. Seventy-four per cent of cases are homosexual/bisexual men, 17 per cent are intravenous drug users, 4 per cent are heterosexual males or females, 2 per cent are transfusion or blood product recipients, 1 per cent have received blood products for coagulation disorders such as haemophilia, and 3 per cent are from individuals from whom insufficient information could be obtained to classify them according to risk group. The rate of disease is higher for blacks and Hispanics than for the other racial groups. The preponderance of blacks and Hispanics occurs primarily in the intravenous drug users.

The distribution of cases by risk groups varies greatly with geographic location in the United States. In the greater New York metropolitan area, over 50 per cent of cases are intravenous drug addicts whereas in Los Angeles over 90 per cent of cases are homosexual/bisexual men and less than 5 per cent of cases are intravenous drug users. In Miami many of the cases are in groups who may have acquired the disease in their native country (for example, Haiti and the Caribbean). In the United States cases are reported primarily in urban areas on the Atlantic, Pacific and Gulf of Mexico coasts.

Until this year the diagnosis of AIDS was made on the basis of the presence of specific opportunistic infections or malignancies with evidence of a specific type of immune deficiency with no known cause, and the presence of antibodies to the Human Immunodeficiency Virus 1 (HIV–1). Fifty-nine per cent of cases presented with pneumocystis carinii pneumonia and 15.7 per cent with Kaposi's Sarcoma. The case fatality rate and duration of survival after the diagnosis are most unfavourable for AIDS cases with pneumocystis carinii pneumonia and most favourable for AIDS cases with Kaposi's Sarcoma. Almost all of the cases of Kaposi's Sarcoma have been reported among homosexual/bisexual men. The reason for this is still unknown as is the reason for the recent decline in the rate of AIDS with Kaposi's Sarcoma.

In August, 1987 the Centres for Disease Control expanded the diagnostic criteria for AIDS to include encephalitis due to infection with HIV–1, "Wasting Syndrome" due to HIV–1 infection, infection with several additional opportunistic infections, and the presence of several additional malignancies.

It is estimated that between one to two million people in the United States are currently infected with HIV–1. The Centres for Disease Control and the National Centre for Health Statistics are both designing and testing protocols for surveys of the general population in order to obtain a more accurate estimate of the actual prevalence of individuals with HIV–1 infection in the United States. It is currently not known what proportion of infected individuals will ultimately develop clinical AIDS.

There are several major cohort studies of HIV–1 infection being carried out in the United States primarily in groups of homosexual/bisexual volunteers. The largest cohort study, which was initiated in 1983 through a contract from the National Institute of Infectious Diseases and Allergy and the National Cancer Institute, includes cohorts of homosexual/bisexual men from Los Angeles, Chicago, Baltimore and Pittsburgh. At least two cohorts of homosexual men, one in San Francisco and one in New York City, have been reconstructed from men participating in vaccine trials for hepatitis B vaccine initiated in the late 1970s. Smaller cohorts of homosexuals, intravenous drug users, haemophiliacs and prostitutes are being followed in San Francisco, New York and Miami. Trends in the incidence of HIV–1 infection in these cohorts and of specific sexually transmitted diseases in the cities with the most cases of AIDS suggest that the rate of HIV–1 infection is declining among homosexuals but not among i.v. drug users and the other risk groups.

Observations from these cohort studies and the case reporting to the Centres for Disease Control have suggested that the major route of infection by HIV–1 is through direct introduction of the virus into the bloodstream through transfusions, injection of contaminated blood products, and use of contaminated syringes and needles. Sexual transmission most often occurs through anal intercourse, probably through traumatic tears in the mucosal lining of the rectum, but also occurs during vaginal intercourse. The highest risk is to the receptive partner in both types of intercourse. There is very little evidence of transmission through other routes. Considering the many health workers who have been exposed to HIV–1 infected patients, there has been very little transmission to this group. Most of the infected health workers have acquired infection through accidental deep jabs with a contaminated needle but only a very small proportion of workers who have sustained an accidental needle stick have been infected.

There have been many estimates of the number of cases of AIDS which will occur by the early 1990s. The current CDC estimate is that 262,000 cases will occur by 1991. These estimates, however, are dependent on assumptions about (1) the rate of HIV–1 infection (which in transfusion recipients and patients with coagulation disorders should now be very low because of the screening of the blood supply and heat inactivation of blood products and which in homosexual men appears to be declining), (2) the proportion of infected individuals who will ultimately develop clinical AIDS, and (3) the impact that drugs such as AZT will have on the course of infection in asymptomatic infection individuals. Most models from which projections of the number of cases in the future have been made do not take into account these variables.

There has been considerable controversy over the possible course of the epidemic among heterosexuals. The proportion of cases attributable to heterosexual transmission (4 per cent) has varied little since the beginning of the epidemic. Thus, although the rate of increase of cases attributable to heterosexual transmission is equal to that in the other groups, this group still represents a small proportion of the total cases.

The development of effective prevention and treatment modalities have been major objectives of research within the United States. Prevention modalities under development include health education/behavioural intervention and vaccine development for prevention of HIV–1 infection and treatment for prevention of disease among those already infected.

Health education and behavioural intervention strategies for other diseases and risk factors have not been very successful in the United States and have required decades for a measurable effect. The rate of infection appears to be declining among homosexual/bisexual men, but it is difficult to know whether this can be attributed to health education efforts which have been carried out primarily by the Gay Community itself. Efforts to stop the epidemic among i.v. drug users has included health education strategies, the provision of clean needles and syringes at no cost, and increasing number of methadone clinics. Although health education is the only current strategy available for preventing infection, there has been very limited support for this strategy at the Federal level because of sensitivities regarding the explicit discussion of risk factors for HIV–1 infection and possible implied approval of drug addiction by provision of free apparatus and methadone which might promote greater usage especially by young adults.

The search for an effective vaccine has been complicated by a number of issues. Although the presence of neutralising antibodies has been demonstrated in humans and chimpanzees, there has been no evidence that these neutralising antibodies can confer protection against AIDS. Because the disease is almost universally fatal and because there is no laboratory model for the disease, there has been agreement that development of a live attenuated vaccine is not feasible. Several new types of vaccine have been developed specifically for AIDS. These include synthetic peptide vaccines and genetic recombinant vaccines which do not have the possibility of reverting to virulence. Although several of these vaccines are currently being tested for safety in humans none of them have yet been demonstrated to confer protection.

Although funds for research were initially slow in being distributed to researchers, this delay was due more to the established process of peer review for allocating of research funds than to political considerations. More funds for AIDS are available to researchers from both public and private agencies than for any other single disease. Fortunately, much of the information which has come forth from these research projects has direct relevance to other diseases, especially immunologic disorders, cancer and neurologic diseases. Because of the need for rapid dissemination of funds, a higher proportion of AIDS research funds from the federal government have come in the form of targeted contracts. While this approach has facilitated rapid funding of research on AIDS, relatively less money has been available for innovative, speculative research ideas which often lead to breakthroughs. The private agencies have provided less targeted research and have filled some of this need.

Although the federal government has been very responsive in providing research funds and in documenting the extent of the epidemic, it has not provided leadership in other aspects of the epidemic such as initiating effective intervention strategies and in anticipating the potentially overwhelming impact of the epidemic on the health care system. President Ronald Reagan first made a public statement regarding the AIDS Epidemic just prior to the Third International Symposium on AIDS held in Washington, DC in June 1987, six years after the first cases were identified. Although the US Surgeon General, Everett Koop, has made major initiatives designed to slow the epidemic, there is, at present, no national policy for the control of the epidemic and provision for the care of cases.

The United States leads the world in the number of cases of AIDS for a single country, in the funding of research and in the production of new knowledge about HIV–1 and the impact on the human body of infection with the virus. We lag behind much of the world in developing a national policy to stop the epidemic and can learn much from the efforts of colleagues in Europe and Africa.

Roger Detels

December 1987

Letter from the Development Trust for the Young Disabled and Research for the Disabled

I am remiss in not replying earlier to your letter dated 3 March concerning your Select Committee on Science and Technology's investigation of the field of Medical Research. Maybe with pause in business due to the Election you will forgive a late entry?

Our Trust was set up in 1974 by a group of benefactors who wished to provide practical help to severely disabled young people in three ways—new modern buildings for their care and treatment; promotion of a research programme to benefit young disabled people nationwide; conferences between people having care of the disabled to improve coordination of effort and dissemination of knowledge.

My Trustees selected the Royal Hospital and Home for Incurables, Putney—then suffering financial difficulty—as the outlet for their ambitions. The resulting close association with the Royal Hospital has brought outstanding benefit, illustrated on the attached card. [*Not printed.*] All improvements have been privately funded from the resources of the two Charities.

New Buildings

As illustrated on the card we have provided:

(a) A holiday home in Brighton.

(b) Three new hospital wings at Putney: One for patients who have recovered some measure of ability for self care (Chatsworth); one as a powerhouse for therapy and research (Alexandra); one as a short stay and day hospital serving severely disabled people in the local community (Drapers).

In consequence the Royal Hospital capacity has increased to 270 permanent residents of whom two thirds cannot dress themselves, one third cannot feed themselves. Additionally we have 30 short stay patients (3–4 months) and 100 day patients per week.

Currently, because HMG has failed to make provision for long-term rehabilitation of severely brain damaged people (they are sent to mental institutions) and because a pilot scheme here is obtaining excellent results, we are building a £2.3 million unit for treatment of these people. It will be the first unit in Britain (and Europe) to provide comprehensive care covering emergence from coma, restoration of mental and bodily function to the limit possible, psychological re-adjustment. Patients, depending upon progress made, will move from the 45 bed unit into permanent care, self care or sheltered living flatlets (all on the RHHI

premises) or return to community life. The whole project lies close to the limit of present medical knowledge and has high research content.

RESEARCH

Because of the high cost of real estate development and our lack of modern facilities, our research programme did not get under way until 1980 (when Alexandra Wing completed). The content of the programme responded to the needs of our patients which were either inadequately provided for or not at all. In brief:

Automated Psychological Testing

APT enables psychologists to communicate with very severely disabled people—typically paraplegic, speechless and brain damaged patients. The tests reveal the extent of brain cell and nervous system damage; indicate what potential there is for the brain to recover control of bodily and mental function through compensating use of surviving cells; also assist in prescribing therapy, mental and physical. Our great hope is that this work, due to end in December 1987, will continue—but in collaboration with the University of Surrey where a new Magnetic Nuclear Resonance Imager will enable the Research Team to monitor the process of brain recovery by scans, co-relating these with our earlier work and assessments. Cost: about £33,000 per annum. The project is unique.

Wheelchair Engineering

Contractures of limbs, distortions of bodily trunk and paralysis are all amenable to treatment. Even small gains in ability or postural comfort can make substantial improvement to quality of life and capability. Our Wheelchair Design Team creates, to the instructions of doctors and therapists, chairs which provide the correct postural support of our patients and maximise their physical capabilities and mobility. Three new designs of chair have been brought from initial concept to final development over five years. Negotiation is in hand with the NHS Artificial Limb Centre, Roehampton, to have two of these chairs NHS adopted for commercial production and doctor's prescription availability. Cost: £70,000 per annum.

Pressure Sores

Pressure sores are the arch enemy of the disabled and, when infected, can be lethal. Collaborative work has been undertaken with two London Hospitals to improve mattresses, particularly for paralysed, bedridden patients. In a new joint venture with the Royal National Orthopaedic Hospital, Stanmore, we are examining means for improving wheelchair cushioning. Cost: £5,000 per annum to our Trust.

Patient Dependency

The physical and mental condition of our patients is related to their ability for self-help. Too much staff help—even if quicker, more convenient, more efficient—can be detrimental to self dignity and ultimately physical wellbeing. A three year study is in hand to assess the proper extent of staff support, skilled and unskilled, to various categories and stages of disability (for example Multiple Sclerosis, Parkinson's, brain injury, stroke, paraplegia). The study will *inter alia* recommend staff: patient ratios, seek out labour saving equipment. Cost: £20,000 per annum.

Huntington's Chorea

Huntington's Chorea is a sad illness—hereditary in mid life, causing disability and dementia—but relatively rare (circa 1,400 cases in Britain). Very little has been done to assess appropriate handling, accommodation, equipment and therapy for use in the home (in the early stages) or later in residences/mental hospitals. A two year project is in hand. Cost: £14,000 per annum.

SEMINARS AND CONFERENCES

My trustees promote one International Seminar each year for exchange of knowledge on caring for and treating disabled people (cost £20,000 of which the EEC provides £6,000). This year the Seminar will be on "The Aftercare of Brain Injury" and held at the Royal College of Physicians. Additionally each month we hold a conference with the different categories and disciplines of those who care for disabled people. These are now largely self funding.

If you sense that evidence from my Trust on the nine questions you pose in your letter would be of benefit to your enquiry, please let me know. My answers in brief would broadly be that disability medicine has low national priority; it is not glamorous; it provides palliatives not cures; the disabled do not "go away" and are a potential permanent heavy burden to the national purse. Government spending on them is fairly meagre—since there is little visible return and a big potential appetite for funds.

We do as much as we can to avoid duplication of research effort (in a fairly thin field) by dialogue with professional and medical establishments and foundations engaged in similar work. Our priorities for research originate largely from perceived shortcomings and difficulties in caring for the 400 very severely

disabled people in the care of the RHHI. We undertake no laboratory research; most is of a practical nature resulting in "things" or "methods".

Captain A D Hutton
Secretary to the Trustees

May 1987

Letter from Dr Gordon N Dutton, Tennent Institute of Ophthalmology, University of Glasgow

I am writing in response to the request for comments on medical research published in the British Medical Journal (Vol. 294) 21 March 1987, page 778. I am currently Senior Lecturer in Ophthalmology in the above Institute. My experience in research stemmed initially from a two year fellowship accorded by the Wellcome Trust to study Toxoplasmic Retinochoroiditis from whence I gained the degree MD. I currently hold a single research grant from the Scottish Hospital Endowments Research Trust to investigate a form of treatment of glaucoma using a pulsed laser. I am also supervising one PhD and one MSc student who are currently conducting clinical research projects.

I should like to address questions 5 and 8.

Question 5—*Are the results of research adequately disseminated?*

It is inevitable that any form of innovative research will culminate in results which do not necessarily fulfil the preconceived objectives and are often "negative". The current establishment view is that such "negative" results are only rarely worthy of publication. Thus considerable time, effort and expenditure goes into work which is not subsequently published and it is only at scientific meetings that one becomes aware of these fruitless endeavours. It has not been uncommon in my experience to hear of different research groups coming up with the same "negative" results.

Considerable savings in expenditure could be made if provision could be made for the abbreviated publication of "negative" results in a form which would be available via computerised literature search.

Question 8—*What changes in priorities in the training of medical researchers are needed?*

It is well known that the training of medical researchers in Great Britain is haphazard. Much of the best clinical research is carried out under the auspices of research grants accorded to young clinicians aiming for further degrees. Scant attention, however, is paid to whether such individuals have had any training in the techniques of research or the publication of their results. I have a number of friends and colleagues who, like myself, have found themselves "in the deep end" when changing over from clinical to experimental work.

Training in medicine constitutes an intensive programme in which very large amounts of factual data must be understood and memorised. During their undergraduate training few students recognise that each piece of information may have been the result of many years of research. A training in medicine therefore provides a poor basis for the new research worker and indeed may be counterproductive. It is common knowledge that the first six months to one year of research fail to bear fruit simply because the new research worker is "learning the hard way".

In order to get the best from the considerable expenditure which goes into the sponsorship of junior doctors carrying out research, I would suggest that the various funding agencies should collaborate in producing appropriate two/three week courses for newly funded individuals with no previous experience in the planning of research and the subsequent publication of results.

Dr Gordon N Dutton
Senior Lecturer

March 1987

Letters from the East Anglian Regional Health Authority

With some delay, for which I apologise, I am responding to your letter to the Chairman of this Authority, Sir Arthur South, dated 3 March 1987 concerning medical research.

I am not now personally involved with such research but I thought it might be of use to get the comments of a Medical Physicist and a Clinical Biochemist (Scientist) and I enclose copies of their letters. Both replies are interesting and I cannot disagree with the statements.

Research is not greatly encouraged in the NHS although I feel this is to its long term detriment. It should be noted that by "research" is often meant "development" rather than a pure search for knowledge but there is a place for both. The service needs come first, I know, but it is sad that a hint of "research" or "development" can damn a case for resources, new equipment for example. The NHS is increasingly and of necessity a "Hi-tech" operation but generally not managed as such.

I look forward to the conclusions of your Sub-Committee.

Dr A H Wragg
Regional Scientific Officer

May 1987

I apologise for the delay in responding to you on this letter and hope my comments are not too late.

I think the Medical Physics Department at Addenbrooke's could be described as being engaged in research and development associated with the use of radiations (both ionising and non-ionising) in medicine for both diagnosis and therapy, and patient safety aspects of the use of such radiations. We also respond on demand to requests for involvement in other applications of physics in medicine.

It is very difficult to answer the specific questions that are raised without presenting a picture of self interest!

(a) Is there any pattern of priorities? Is not research driven forward primarily by the enthusiasm of, and pressure from, individuals and groups?

(b) See my concluding comments.

(c) Further research is required into the impact of new technology. Can we afford it? What will be the impact on clinical and nursing procedures? What kind of structure is required within the Health Service to support the new technology and will we be able to provide it?

(d) A very high proportion of the funding comes from Charitable Organisations. This has a major influence on the types of more fundamental research that are done.

(e) Yes—in general.

(f) It depends what is intended by "unnecessary". A certain amount of duplication is unavoidable and in fact desirable to corroborate new findings. I doubt if there is excessive duplication.

(g) Broadly speaking yes. It is almost impossible to apply cost benefit analysis to innovative research.

(h) What is a medical researcher? In general we are talking about NHS or University Clinical School staff (medically qualified or science graduates—usually with Higher Degrees) who also do research. It would be a pity if changes were made that resulted in some posts being OK for research and not others.

(i) See concluding comments.

CONCLUDING COMMENTS

More important than all the above is the need to take a long, hard look at how the Health Service is going to assimilate the fruits of the research that is presently in progress. There are two fundamental points that are scarcely being addressed at all.

(a) Health care is no longer limited by knowledge. It is limited by money.

(b) What are the social and economic consequences of progress in patient care or health education? No life is ever "saved", we simply postpone the day when terminal care is required.

There are no easy solutions to either of these questions but there is an urgent need for policies and those policies could point the way to the best answers to many of the questions posed.

Dr P P Dendy
Chief Physicist

April 1987

Thank you for sending me a copy of the letter concerning the enquiry on priorities in medical research.

I find it very difficult to respond to many of the questions and can only answer in relation to my own limited experience.

I think that my major comment in relation to the National Health Service and medical research is the lack of encouragement given to scientists. The NHS has a wealth of opportunity to cooperate with academic institutions and to *encourage research directly*.

However; I feel that the NHS is doing very little to attract good scientists into employment. I can speak with some authority in my own discipline—clinical biochemistry. There is very little encouragement given (nationally by government) to develop an effective manpower structure for clinical biochemists that will attract high calibre scientists. I would suggest that an effective manpower policy with appropriate career development opportunities could attract some of the best scientific brains into the NHS. The alternative is limited tenure, no career development, poor salaries and the best people going abroad—WHICH IS WHAT HAPPENS NOW!

At present there is little support for the development of technology in medical research. Consequently we are seeing the best technological advances being made in the US—often with ideas that were born in the UK.

The DHSS does not have sufficient funds to sponsor research and furthermore it does not have sufficiently good links with research groups to make the best of the resources available.

I trust that these comments are helpful.

Dr C P Price
Top Grade Biochemist

April 1987

Memorandum by the Economic and Social Research Council

THE ESRC'S ROLE IN MEDICAL RESEARCH

1. The ESRC is concerned with supporting research into the economic and social aspects of health and health-care provision and it is in this light that responses have been made to the Sub-Committee's questions. Health research supported by ESRC, described in more detail below, develops and applies research methods in the context of the social science disciplines. Such work is not best described as "medical research" but much of it is included in the area defined by the Medical Research Council as Health Services Research. It does not include strictly epidemiological studies or the medical evaluation of routine procedures or intervention studies. There is a strong bias toward basic research into health-related behaviour, mental processes among patients and carers, and economic and organisational studies of health care delivery.

ESRC'S PROGRAMME

2. A good proportion of the research supported by ESRC bears directly or indirectly upon health issues. Five of ESRC's research centres are directly concerned with health matters. These are listed below, joint funders are shown in brackets and a brief account of their work is given:

— Centre for Health-related Studies in Education and Family Health, Thomas Coram Unit, London: A study of the perspectives of parents and health visitors on child-rearing and an investigation of the health of parents and the care and welfare of their children.

— Centre for Health Economics, University of York (with DHSS): large integrated programme of research is carried out that examines social and economic influences on health, the assessment of "quality of life", outcomes of treatment, the demand for and supply of health care, market equilibria in health provision and planning, budgeting and monitoring mechanisms.

— Centre for Addiction Research, University of Hull: In partnership with CHE at York, this centre concentrates on policy issues in relation to alcohol and tobacco.

— Research Unit in Health and Behavioural Change, University of Edinburgh (with Scottish Health and Home Department and Scottish Health Education Group). This Unit was placed in Scotland to address problems of a locally high rate of behaviour-related disease, and investigates the relationship between lifestyles, health information systems and health behaviour.

— Social and Applied Psychology Unit at Sheffield (with MRC): This unit investigates a wide range of health-related topics, in particular the relationship between stress, work and unemployment and the

use of information technology in health services. (The ESRC's large programme of research into the social and industrial effects of the growth of information technology also includes the study of health services applications.)

3. ESRC also supports a wide range of health-related research through its Research Grants Scheme. Among projects currently in the field are studies of:

— Factor Inputs in NHS Hospitals, a study of the degree of substitution that has occurred in the NHS between 1951 and 1981 in its use of resources, especially labour, capital and materials.

— Patients' comprehension of doctors' instructions.

— Professional self-regulation of the General Medical Council.

— GP Consultations and Concepts of illness among Asians in Bristol.

— An international comparison of the community care of "stay at home" very elderly people in Italy, Ireland and Britain.

— Health economics and its practical implications, a study in the sociology of scientific knowledge of the use of ideas of practical utility in health economics.

— Medical student selection and education.

— The social organisation of interdisciplinary work in primary health care.

4. In addition to those projects explicitly concerned with health issues, ESRC has supported work that is intended to influence policy and practice in health policy and provision. For example, Professor Rabbit's work on ageing is investigating what medical and other factors influence the extent to which people retain their mental efficiency into old age; the Cambridge Group for the History of Population and Social Structure carries out influential research into trends and changes in fertility and family formation. Other ESRC supported work in child care, information technology, economics and psychology is used by those engaged in applied work in health.

5. Much of the basic work done by ESRC-supported researchers underpins the work done by social scientists working in DHSS policy areas and the National Health Service. The DHSS attaches importance to ESRC's central role in the training of skilled researchers in the range of social science disciplines. Likewise, many aspects of the training of medical personnel are based upon the understanding of human relations established by social research supported by ESRC over the past twenty years.

Research Priorities

6. ESRC's research priorities are clearly reflected in the programme described above. For the future the ESRC's programme on the social and behavioural aspects of AIDS will feature strongly. The aim is to create the strategic research base from which an effective programme of health education, health policy and intervention strategies can be developed. Efforts in this urgent area will require wider support than can be provided by a small research council. There is a growing view, especially among senior health officials in the United States, that behavioural research has a central role to play over the next four years. It is essential that this role is acknowledged in Britain where medical and official opinion has previously been less receptive to the value of such research. In the absence of a cure or a vaccine for AIDS, research that stimulates fresh ideas in health education that lead to behavioural change will contribute directly to a reduction in the incidence of HIV infection.

Multidisciplinary research will be needed to study the non-medical aspects of the clinical management of AIDS.

7. Over the past 20 years, a sufficient body of research on the social and economic aspects of health has been funded to suggest the timeliness of a serious review of its contribution. The growing interest in the value of this activity provides an opportunity to develop a strategy for its use and expansion in the future.

This would require a rigorous mapping of all research supported by the research councils, by DHSS and now by many health authorities, as well as a critical analysis of the results over the years. Such an enquiry would have to be conducted centrally and with a high level of authority. Its aim would be to establish a clear case for the demand for social knowledge in health care and to assign reasoned priorities to the research needs identified in this way. As the UGC's recent review showed, there is a depth of skill in Britain that ESRC believes could be mobilised more effectively in the pursuit of better health care and provision.

8. There are two further areas to which ESRC would like to draw attention:

Health Services Research

9. We note the recent initiatives of the MRC in this area and are represented on the MRC's Health Services Research Board and cooperate closely with them. The study of the effective delivery of primary health care is in our view still an underfunded area of research activity. Central to this problem is the question (h) raised by the Sub-Committee concerning training. No real career structure exists for young researchers in this area and the NHS has been obliged to rely heavily on costly management consultancies to fill this gap in its search for improvements in practice and organisation. Overall research priorities in medical research should be informed by the understanding of demand and use that arises from well-conducted enquiries on the performance of the whole system of health service provision. Fellowships could usefully be provided to train both medically qualified people and social scientists in Health Services Research.

Their attachment to NHS administrations could bring considerable dividends in setting appropriate research priorities and administrative strategies.

10. We note that this view is strongly shared by the Heads of Departments of Community Medicine. We also share their view that such training should be strongly multidisciplinary in character. ESRC's collaborative funding policies in this area have brought success on a small scale in forming teams of researchers from widely differing social and medical disciplines. There is a growing demand for more multidisciplinary expertise, as exemplified by the support given by the Trent and the Northern Regional Health Authority to the York Health Economics Consortium.

Science Policy

11. ESRC has expanded its investment in the study of science policy, including medical and biological science or, as they are now called, the life sciences. New work has been funded, in the Science Policy Research Unit at the University of Sussex to assess the whole process of innovation and achievement in science.

12. A Science Policy Support Group has been established in London to coordinate and advance the programme. This includes a research initiative, using eight centres, to study the public understanding of science. Medical research can have a considerable impact upon public consciousness, for example, research into fertility has been accompanied by great public debate that has conditioned its future direction. Yet little is known of the ways in which lay people form their understanding of the results and products of such research. New advances in genetic engineering will attract similar public concern. We attach considerable importance to research that will lead to greater understanding of the relationship between life sciences and their social impact. In future, medical research priorities will be strongly influenced by the climate of public opinion, by moral and ethical considerations and by the public assessment of risks that may attach to new and sometimes, startling possibilities that medical research can offer. It is essential that this process is better understood. A second phase of research in this area is planned, subject to the availability of funds, and will include the study of the needs and understanding of new information among people suffering from chronic medical conditions.

Letter from the English National Board for Nursing, Midwifery and Health Visiting

I am responding to your letter to Mrs Poole, Chief Nursing Officer DHSS, a copy of which has been forwarded to this Board with I understand your agreement.

The Board has recently consulted all its committees on research priorities and the enclosed document has been agreed by the Board as a list of research priorities. There is to be some refinement of the questions but in view of your timetable I am sending it in its current form.

The Board does not have money to undertake the research but these research topics are seen to be those that are priorities to underpin effective development in the education of nurses, midwives and health visitors. The list will be widely circulated to training institutions providing ENB courses and other institutions known to be interested in or already involved with research activity associated with nursing, midwifery or health visiting. It is the wish of the Board that if any such institutions see fit to pursue some of these questions they would work in association with the Board.

I hope this information is of help to your committee, the Board would be willing to give further information if that is seen to be helpful.

Mr David Jones
Chief Executive Officer

September 1987

RESEARCH PRIORITIES

1. The Learning Environment

Problem Statement

The arrangements made for student nurses to be placed in hospital wards or departments, the community or other settings has become increasingly related to their learning needs and less determined by their "workforce" contribution. Proposals for supernumerary status for students and recommendations for closer links between nursing and midwifery training schools and the higher education sector have further implications.

There have also been changes in emphasis regarding patient care; from care in hospital to care in the community with concomitant changes in orientation of training from being disease centred to becoming health focused.

However; it is unclear whether awareness, experience or competency in health focused practice in community settings is being sought at completion of first level training and whether and how this can be achieved.

Because of its awareness of the need for staff to remain competent, develop their professional practice and keep up to date, the Board will, in future, only approve for training purposes those Institutions which have implemented a satisfactory continuing education policy for nursing, midwifery and health visiting staff who are involved in the teaching, supervision and assessment of students.

Research Questions

(i) What is the impact on learning and teaching of the move from institutional care to the community?

(ii) What is the quality of experience gained by students in community placements?

(iii) What are appropriate learning and teaching strategies in different types of clinical/practical placements and with different groups of patients/clients?

(iv) What is the appropriate ratio of trained staff to students to enable optimum learning, teaching and supervision to take place?

(v) Is the provision of community experience in basic nursing education feasible?

(vi) Are there alternative methods of providing experience and meeting learning needs?

(vii) Can community awareness only or competencies be achieved?

(viii) How effective is student centred learning?

(ix) How effective is the use of open learning materials?

(x) What are the implications of closer links between nursing or midwifery training schools and the higher education sector?

(xi) What are the continuing education needs of the teacher/practitioner?

(xii) Are innovations in continuing education being evaluated?

(xiii) Do the training courses adopting 1982 "new" syllabuses prepare nurses to work in the rapidly changing situation of mental health care?

(xiv) Is there any difference between practitioners who have undertaken specific courses of preparation (for example course 811—Nursing Care of Mentally Ill People in the Community) and those who have not?

2. Examinations and Assessment of Competence

Problem Statement

The policy of the Board is to devolve examinations to training institutions. The Board is also ceasing to approve courses preparing clinical teachers and has instead developed courses for all those teachers/practitioners with a responsibility for teaching and assessing students in the clinical and practical work areas. The use of the former pattern of four practical tests in basic general nursing is being replaced by continuous forms of assessment.

Research Questions

(i) How comparable are the various schemes of continuous assessment and examinations?

(ii) Is a national standard being maintained?

(iii) How valid and reliable are the schemes being adopted?

(iv) Do schemes of continuous assessment assess the achievement of competencies?

(v) Do examinations and assessments developed to date measure "good practice"?

(vi) What is the role of the teacher/supervisor/assessor and is the current preparation for the role in hospital and other groups (for example occupational health nursing) appropriate?

(vii) What are the continuing education needs of the teacher/practitioner?

3. TEACHING AND TEACHERS

Problem Statement

The Board's policies regarding rationalisation of nursing and midwifery training schools; the increasing links between these schools and the higher education sector; the improvements anticipated in practice based teaching which should follow the provision of courses of preparation for teacher/practitioner roles and the development of open learning materials for experienced teachers, will all affect teaching and teachers. Supernumerary status for all students will also lead to changes in the organisation and management of training courses.

Research Questions

(i) Are teachers being adequately deployed?

(ii) How is the term teacher:student ratio being interpreted and used and with what significance?

(iii) Are student nurses seen as "part-time" or are they "followed through" by tutors?

(iv) Is tutor time utilised most appropriately?

(v) What is the role of teachers?

(vi) How effective are teacher activities?

(vii) How do teachers teach?

(viii) How are teachers prepared for their role?

(ix) Are teachers facilitated in their professional development?

(x) What approaches to teaching are used in ENB approved courses? What are the difficulties encountered?

4. OTHER EDUCATION AND TRAINING MATTERS

4.1 The UKCC Report "Project 2000" indicated that knowledge and skills of various branches of nursing can be shared in a common foundation programme.

(i) What is the shared knowledge?

(ii) What are the shared skills?

(iii) Are innovations in continuing education being monitored and evaluated?

4.2 Other reports and consultative documents such as "Neighbourhood Nursing" (Cumberlege Report), "Primary Health Care" and WHO publications have proposed changes and developments.

(i) In these contexts, what is the role of the Occupational Health Nurse? What competencies are required of the practitioner?

(ii) Is the theoretical underpinning of health visitor courses appropriate and could this be evaluated?

(iii) Is there a role for "specialist clinical nurses" within primary health care and if so what are their education and training needs?

4.3 The nursing care of sick children is of continuing concern especially the availability of sufficient appropriately qualified staff to provide care and teach/supervise students. Representation of these matters at unit and district level appears variable as does the professional support provided for recently qualified and experienced staff.

(i) Is there sufficient support and representation for paediatric nurses by appropriately qualified persons at unit and district level in order to improve paediatric nurse training?

4.4 It is proposed to increase the number of courses for direct entry midwifery training.

(i) Is such a policy to be monitored and evaluated?

4.5 Two topics are relevant to all aspects of nursing, midwifery and health visiting.

(i) The teaching of ethics in training courses.

(ii) An investigation of the attitudinal issues surrounding the problem of AIDS.

Memorandum by the Faculty of Dental Surgery of the Royal College of Surgeons of England

DENTAL RESEARCH

The scope of Dental Research

Persons outside the profession, and even doctors, frequently have a limited view of the scope of dental research and believe it is mainly concerned with the two obvious dental diseases of caries and periodontal disease. This is a simplistic view and, with the awareness of a current apparent decline in the prevalence of caries, has led to a reduction in the priority awarded to dental research as a whole. Neglected areas remain in:

1. *Caries and Periodontal Disease*. Whilst there is a current decline in the prevalence of caries in children and young adults in industrialised Western countries, the disease is still increasing among the majority of the world's population. Furthermore, it remains to be seen if the current trend in developed countries can be sustained and whether the factors reducing caries in the young will be as effective in those forms of attack seen in middle and old age.

Periodontal disease affects more individuals than caries, it is particularly prevalent in an increasingly older population, and is largely an unsolved problem.

Both of these diseases afflict human beings on an epidemic scale, have a complex multifactorial aetiology, and manifest themselves in a variety of forms. Moreover, they are responsible for large scale morbidity and their treatment is both time consuming and costly. Research aimed at increasing our understanding of these diseases which leads to their control by preventive measures is therefore likely to be cost effective both in terms of cash and human misery.

2. *Developmental Abnormalities*. Irregularities of the teeth, malocclusion and deformities of the jaws, face and even skull form other groups of conditions for which the causes are multifactorial. They are also widespread among our citizens and disadvantage the individual. The management and correction of these abnormalities by interceptive treatment, orthodontics and surgery have made great strides during the last 30 years with improvements in long-term results, but because of the length of time over which success or failure must be monitored the accretion of soundly based knowledge is slow. Investigation of the aetiology of these conditions is difficult. Much that is currently known is speculative, based upon observation rather than experiment; with the exception of certain abnormalities such as hare lip, cleft palate and "first arch" deformities which have been studied in-depth. Even in these special cases knowledge is still insufficient to make possible a preventive approach to the problem.

Studies on the prevention of neural tube defects by peri- and post-conceptional supplements of vitamins and folic acid are being extended to the prevention of cleft lip and palate and "first arch" defects. Early pilot studies suggest that a proportion of these common abnormalities may be preventable.

Support is needed for multicentre trials in this field of study. The cost benefits to the NHS of preventing these "expensive" defects could be considerable.

3. *Repair and reconstruction of the teeth and the jaw bones* following destruction by disease or surgery has resulted in large scale research in materials science and a tradition of research into allelografts and their application in the surgery of bones, joints and soft tissues which is at least as great as that of orthopaedic surgeons.

Beyond these obvious fields of interest are many others:

4. *Malignant disease of the oral tissues* is as accessible as that of the skin for studies in humans. While carcinoma of the oral mucosa is uncommon by comparison with that of breast, lung and prostate, its prevalence is by no means negligible and the distress which it causes the individual patient probably greater. Again great strides have been made in treatment, but largely in modifying the progress of the disease, in reconstructive surgery which improves the post treatment quality of life, and in producing remission rather than ultimate cure of what is often a multifocal disease. Locally acting aetiological factors have been identified but not the mechanism by which they act. It should be possible to devise preventive regimes which would reduce the incidence of this condition, but their evolution and application is dependent upon further basic research. For example, there is now evidence that a greater proportion of patients with oral carcinoma, than members of the population generally, are both heavy smokers and spirit drinkers. Research to confirm this, and if possible explain the mechanism, could form the basis of a preventive programme.

5. *There are many other groups of diseases which affect the oral mucosa*, the bone of the jaws, the tongue, salivary glands and saliva which are the subject of dental research and of course the biology of mucosa, bone and the salivary glands is an important basis for this activity.

6. *Epidemiological studies.* The success of preventive and treatment regimes needs to be monitored by sound epidemiological studies and the periodic dental health surveys provide an important part of this epidemiological data. Studies repeated on a regular basis reveal trends which permit predictions for the future and are important also for manpower planning. Many dental therapeutic and preventive regimes depend upon the patient's compliance. There is great ignorance about the factors that govern patient response in this way and this is an area where research is required.

WHERE DENTAL RESEARCH IS CONDUCTED AND THE INVOLVEMENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

Much dental research is conducted within the universities and specifically, within the dental schools. The Medical Research Council has from time to time established units conducting dental research and currently supports the unit attached to the London Hospital Medical College which forms part of the tripartite research unit under the direction of Professor Newell Johnson. The other two components of this organisation are the Department of Dental Science here at the Royal College of Surgeons of England, and the Dental Research Unit, which like the Department, is a part of the College's Hunterian Institute and is based at Downe. Research in these Departments is supported by all the major grant giving bodies and also by the College from the results of its appeals. The tripartite organisation currently needs an injection of a substantial amount of new monies.

Commercial companies support both commissioned and "in-house" research. While they will support basic research of no immediate commercial value they are naturally more interested in projects which promise a material, drug or equipment capable of exploitation by the firm.

PROBLEMS WITH FUNDING AND SUPPORT FOR DENTAL RESEARCH

1. *Funding.* The major grant giving bodies maintain that there is a lack of applications for support of projects of merit from dentistry. To a degree this is probably true although it is known that applications from persons and organisations of standing are turned down. Moreover, as the funds available through these major bodies have been restricted in recent years there is the suspicion that when a medical project is weighed against a dental one that the former may be judged to be of more importance to the community at large.

Dental diseases lack the appeal by comparison with others such as cancer and heart disease which readily bring in public subscriptions to support research. Furthermore the need is often for relatively *small scale* funding to permit the initiation of projects.

2. *Location of Dental Science Departments.* Staff in dental schools face different problems dependent upon whether they are in the basic or applied sciences departments or in one of the clinical disciplines. Even when dental basic and applied science departments are associated with their medical counterparts they are often small by comparison with those of the major science faculties of universities. Consequently they do not have the range of accommodation and equipment to be found in large departments. The move to re-site medical and dental science departments in association with their general science counterparts will encourage the sharing of expertise and physical resources which will enable their staff to engage in more sophisticated research.

3. *Problems of research workers who are also clinical teachers.* Clinical teachers face more serious problems. Like their medical counterparts their teaching commitment is not confined to term time but is equal throughout the calendar year. Further the nature of clinical dental teaching demands the close supervision of small groups of students, during the treatment of patients. This is necessary to ensure the safety of patients and the effective acquisition of clinical skills. Furthermore, clinical teachers must advance their own postgraduate clinical training, matching in this respect the progress of their hospital counterparts who will not have the same teaching responsibilities. In-service training carries with it a commitment to patients beyond that required to perform their role as teachers. Clinical teachers often have inadequate time left for research.

The loss of over one hundred clinical posts from dental schools during the last five years has placed an unacceptably heavy load of teaching and clinical work upon the remaining staff to the further detriment of their research activities.

4. *Facilities.* The laboratory facilities made available to clinical departments in dental schools are often small so that both a lack of time set aside for research and lack of space form a significant disincentive to participate in this activity. Clinical dental schools should be sited close to preclinical departments and should have research accommodation and equipment as of right.

5. *Problems of commercial support.* While commercial firms may be generous in supporting selected research projects, problems can arise in relation to the publication of the results. If they are unfavourable and relate to a product which is already on the market they may wish to suppress the results.

THE SUB-COMMITTEE'S SPECIFIC QUESTIONS

Priorities in Research and Organisation

The concepts implicit in questions (a), (b), (c) and (d) would strangle at birth much worthwhile research.

Research is dependent upon people of intelligence who have ideas. The value of their work may only become apparent as it develops or in retrospect and when it has been completed and its application made obvious. Many projects are of necessity small scale in the beginning and unlikely to appeal to major grant awarding committees.

Directed major projects can be founded to tackle only obvious deficiencies in knowledge, to exploit new technology or to meet a commercial challenge. Such projects are rarely innovative in a fundamental sense and the perceived need which governed their initiation may have changed or vanished by the time the work is completed.

The dissemination of results and duplication of Research—(e,f)

Duplication of research is not necessarily a bad thing or a waste of resources. Work which cannot be repeated with similar results is of dubious value. Repetition of previous work may be a prudent step before further development of a line of research.

The reflection of Research in improvements in Patients Care—(g)

1. *A failure of industry in this country to exploit discoveries* made by our scientists leads to a situation in which we have to pay a premium price to import equipment, drugs and materials. Not only do we have to pay premium prices but the inventions do not give the country commercial advantage. For example, lack of enterprise and commercial resolve has permitted the exploitation of all the major advances in imaging technology to drift abroad.

2. *The costs of modern advances are not adequately funded in the NHS.* In the hospital service certain proven diagnostic and therapeutic measures are not readily available because of their high costs. Similarly, in general dental practice valuable new materials and clinically researched techniques are only recognised and funded after substantial delays. Health Service budgeting and payment systems need to take account of the rising cost of new developments although it is recognised that the scale of rising costs presents a significant problem.

Changes in the priorities in training for Dental Research and changes in organisation and funding—(h) and (i)

There are very few full-time salaried dental researchers with permanent contracts. Most are teaching staff in dental schools with other commitments. An increasing number of NHS staff are involving themselves in research, but fewer than is desirable and a smaller proportion than in medicine. The majority of full-time research staff are MSc and PhD students or research assistants employed through short-term project grants without security of tenure. While such arrangements are suitable for young persons at an early stage in their career, such basic insecurity creates great problems for older, married staff with family responsibilities. A core of permanent personnel are essential to sustain a field of research where advances can be made over the longer term, and to provide out of the larger project individual topics which PhD students can pursue under supervision.

Dental undergraduate education is vocationally orientated, indeed orientated mainly towards the production of general dental practitioners with the trend increasing in this respect. A recommendation that the course should be standardised at five years, with a greater proportion of the time devoted to basic sciences seems unlikely to be acted upon. Indeed, it has been suggested that if extra time is allotted it should be devoted to vocational training specifically for general practice. As a principle undergraduate education should provide the basis for all careers in dentistry and vocational training strongly biased in one direction, organised as a postgraduate activity. If the scientific content of the undergraduate course is not improved high academic achievers will be dissuaded from entering the profession.

Since much of dental research is conducted by the teaching staff in dental schools, the present trend to increase the proportion of their time spent upon teaching and clinical service must be reversed and adequate time for research restored. It is argued that not all teachers are sufficiently interested in research to justify this allocation of time. While research and the advancement of knowledge, which is not necessarily laboratory based, should be a major component of academic life if teaching is not to become dated or inappropriate, for some it is not a major attraction. It should be up to Heads of Departments and Deans to see that these members of staff undertake a greater proportion of the administrative tasks which academics must also shoulder.

Opportunities for new dental graduates to obtain sustained instruction in basic research methods and technology should be increased, and greater emphasis given to research in all fields of dentistry. Dilemmas facing academics in their training pathways need to be resolved. Those who can combine successfully scientific research with improvements in patient care need to be identified and encouraged, but without disadvantage to those whose abilities lie in different directions. These matters are of paramount importance if the prevention of dental disease is to be enhanced and the dental service within the NHS improved in quality.

April 1987

Letter from Mr John V Farman, Consultant in Anaesthesia and Intensive Care, Addenbrooke's Hospital, Cambridge

The Select Committee on Science and Technology, through its Sub-Committee II, has requested the views of individuals and institutions on priorities in medical research. As a consultant in the related fields of Anaesthesia and Intensive Care at a busy general teaching hospital, I would like to make some points.

The need for research in Anaesthesia which includes all aspects of perioperative management is far from being met, despite the existence of academic departments in most Regions (but not so far in East Anglia). Few anaesthetists hold MRC or similar grants and most research is on a small scale, often supported by drug company or local NHS grants. The subject is closely linked with postgraduate training, which suffers from a lack of the rigorous discipline of research. The well publicised tragedies which still occur during anaesthesia are a testimony to this deficiency. The position in the field of Intensive Care is even worse, with only one senior academic post in the whole of the United Kingdom. Although research into the causes and management of acute illnesses is in the province of a number of specialties there remains a core of knowledge and expertise which is central to the discipline of Intensive Care. This is an area where the surface has so far barely been scratched.

I have taken a particular interest in anaesthesia for liver transplantation and have published a number of reviews of our experience in the management of these cases, have written chapters on the subject and have edited a book on Anaesthetic and Perioperative Care of patients undergoing Organ Transplantation. I have also taken an interest in the provision of intensive care facilities and have surveyed the scene in the British Isles as well as initiated a more local system of audit. I am editor of a bi-monthly journal "Care of the Critically Ill". While on the Council of the Intensive Care Society I was largely responsible for the production of their Standards for Intensive Care Units; a list of relevant publications is appended. My present aims include the initiation of a system of audit and clinical investigation of patients undergoing liver transplantation. In the field of Intensive Care I am anxious to complete my initial survey and then to concentrate on the important clinical subject of fluid and electrolyte balance in critically ill patients, which remains poorly understood.

As for the specific questions asked in the letter, I can answer only from the point of view of a busy clinician. I believe that priorities in clinical research largely arise from the interests and enthusiasm of individual clinicians. Examples are of perceived needs, such as the realisation of a clinical problem, or of a response (in our case) to the demands of new forms of surgery. I doubt if the balance is right, but who in any case is to say what is right? We don't even know what all the problems are. I would favour cutting back on "wasteful" research projects in paraclinical fields, and increasing the emphasis on clinical audit, which alone will reveal many problems worth investigating. I think that priorities do adapt to changes, but far too slowly. Sources of funds may well determine the sort of research undertaken; for example, it is quite easy to get drug company support (for work on their own drugs!). No doubt institutions are aware of this. Dissemination of results is haphazard; it depends not only on the quality of the work, but on the particular interest of the journal in question. Duplication may be a problem, often associated with a lack of original thought. Improvements in patient care may be slow to take place and in any case are difficult to measure, especially when many factors are involved.

As far as clinical investigation is concerned, trainee clinicians need to be exposed to the discipline of research, by attachment to an academic department, for at least a year. This already happens in some specialties, such as general surgery, where competition is strong. A particular lack is that of statistical knowledge and skill, as revealed in Altman and Gore's "Statistics in Practice" (BMA Publishers, 1983). It largely boils down to money; more is needed at a local (that is Regional) level for clinical research projects. Time also needs to be made available for clinicians to undertake research.

I trust that these few comments will be of assistance to you.

May 1987

Memorandum by the Fellowship of Engineering

SUMMARY

Priorities for medical research are based on the availability of research funds, medical need and available skills.

A balance is required between research carried out to increase scientific knowledge and that designed to meet specific objectives, contracted research should not deplete resources needed to maintain basic scientific research. Additional resources are required for medical engineering and concern is expressed about this activity coming solely under the Materials Committee of SERC. It is desirable to separate the funding of research from that for treatment or prevention.

Substantial funds are made available for research by charities particularly in areas of public awareness of need. This may lead to overweighting of these areas against more mundane areas of relevance to the National Health Service. Close liaison between major funding charities and the Medical Research Council is commended.

There is adaptation to changing incidences of diseases and changes in population structure. New technological capability leads the clinical application of this knowledge. New technology may be expensive due to capital or operating costs. The new technology itself may be more economical than that it replaces, however, the impact of the new capability to treat previously untreatable conditions may limit the widest application of the research.

Better dissemination and exploitation of research and avoidance of duplication of research effort would be helped by the type of coordination and monitoring provided by the SERC Specially Promoted Programmes and Directorates. A training need was perceived for clinical researchers to be more familiar with systems concepts, mathematical models and computer applications. The difficulty in obtaining support for projects which encompass engineers, clinicians, physiologists and mathematicians is highlighted.

The exploitation of research and development is limited by lack of capital investment in industry and the limitations of the British market. A healthy domestic market for high technology is required if the nation wishes to compete abroad.

(a) The Setting of Priorities for Medical Research

Priorities for medical research are based on the availability of research funds, medical need and available skills. The needs of the National Health Service (NHS) are taken into account when funds are allocated by the Department of Health and Social Security (DHSS) Procurement Directorate and, to a lesser extent, by locally organised schemes in the NHS which also encourage new workers into research.

The Medical Research Council (MRC) supports work of high scientific merit; the results may not be of direct relevance to the NHS except for major projects in defined areas, for example nuclear magnetic resonance.

Support from charitable organisations is goal-orientated and its relevance to practical application is important. However, large sums of money are made available through charities, for example, for cancer and heart disease research because of public awareness of need. These areas may be overweighted compared with the mundane but equally costly fields for the NHS such as pressure sore relief or the development of improved prostheses.

(b) Balance between Branches of Research

An appropriate balance is required between research carried out to increase scientific knowledge and that designed to meet specific objectives. The best research is achieved by workers intensely interested and thus highly motivated in their fields. Concern was expressed about the customer-contractor approach to research sponsorship, contracted research should not deplete the funds needed to maintain basic scientific research.

The MRC is faced with a considerable dilemma on whether to support basic medical research or underpin more applied research. A move to supporting applied research is likely to impose a further pressure on funding of basic research.

As previously mentioned, charitable funds are collected in response to public awareness, and this may lead to emotive areas receiving the highest priority.

The funding of medical engineering used to fall between the briefs of MRC and the Science and Engineering Research Council (SERC). More recently it has been funded through the Materials Committee of SERC. Funding for this area is still considered inadequate and doubts were expressed about the appropriateness of medical engineering being dealt with solely by the Materials Committee.

(c) Adaptation to Change

Research is adapting in response to, for example, the need for research into AIDS. There is adaptation to the use of new technology but available funding limits the rate at which change can occur. New technological capability leads the clinical applications of this new knowledge, for example new instruments are developed possibly for non-medical use initially but are later used for clinical purposes. However, concern was expressed about the level of knowledge of manufacturing and processing within the DHSS, for example, as relevant to the production of drugs and on the processing of blood products. The use of mathematical models of metabolic and physical systems and the use of such models in the indirect measurement of otherwise inaccessible variables in humans was thought to be a promising area requiring further support.

(d) Balance between Public, Commercial and Charitable Funding—Influence on Priorities

There is a moral dilemma between funding treatment or preventative measures and funding medical research. Hence, it is desirable to separate the funding of research from that of patient care and the Medical Research Council's grant-in-aid is an example of this. In addition, there is a division between the funding of "fundamental" research compared with "directed" research which receives greater commercial support. Charities may distort the picture by making money available for very specific areas of research. Close liaison between charities and the MRC as practised by the Cancer Research Campaign is commended.

(e) Dissemination of Research Results

The dissemination of research results was considered to be good generally, but, a problem associated with administration was highlighted illustrating the need for closer cooperation between funding agencies. The appointment of coordinators, as used by SERC in Specially Promoted Programmes was thought to assist dissemination and exploitation of research results.

(f) Avoidance of Unnecessary Duplication of Research Effort

Avoidance of duplication of research effort is largely the responsibility of the funding organisations, which should be well informed and obtain independent advice as appropriate. Peer review procedures help avoid duplication and companies were generally thought to have a good knowledge of similar research undertaken by competitors. The concepts of the SERC's Specially Promoted Programmes and Directorates with emphasis on coordination and monitoring were considered suitable for wider application.

(g) Degree to which Research is reflected in Patient Care or Health Education

There can be a long time-lag between fundamental work being carried out and improvements in patient care or health education, for example the work of Perutz, Crick, Sanger and Kendrew in the 1950s. The DHSS Procurement Directorate is concerned with improvements in health care and education, however, new technology may be expensive due to either high capital or operating costs. In addition, the effect of new technology may be to allow more severely ill patients to be treated who would not have survived previously. In general, hospital patients are now more acutely ill and require more care due to their acute illness or expensive treatment including surgery.

The new capability to treat previously untreatable conditions which limits the widest application of the results of research due to limitations on funding. The difficulties in finding suitable medical equipment manufacturers willing to produce a small number of specialised instruments was highlighted. Engineering aspects of medical research on joint diseases and artificial limbs highlighted problems in organising products and the system for delivering them, coupled with the difficulty of obtaining reliable feedback from clinical trials. Artificial limbs and joint replacements are economically important; as well as beneficial to users, however, experts in the field are not aware of what, if any, comparative costing studies have been carried out by Government departments or other bodies.

(h) The Training of Medical Researchers

A great deal of research is carried out by non-medical scientists and engineers working in the Health Service, the universities and industry. Arrangements for training such personnel are appropriate to the current level of research funding; if funding was increased additional training provision would be required. A need was perceived for clinical researchers to become more familiar with mathematical techniques through awareness courses on systems concepts, mathematical models and computer applications.

(i) Improving the quality, quantity or application of research

There is a need for the Research Councils to be more flexible when new research areas are put to them which do not fit their normal brief. It is difficult to obtain support for multidisciplinary work by groups of, for example, engineers, clinicians, physiologists and mathematicians. Further coordination of Research Programmes with monitoring and dissemination of results is urged.

It is considered that the exploitation of fundamental discoveries and initial instrument developments carried out in the United Kingdom is thwarted by lack of capital investment in domestic industry and by the limitations of the British market. A healthy domestic market for high technology medical equipment is required if the nation hopes to compete abroad. At present there are 25 magnetic resonance imaging machines in Britain; there are more than 500 worldwide and the world market is likely to exceed 1,500

within five years. Much early work on this technology was carried out in the United Kingdom; many of these graduates now work abroad.

Letter from the Foundation for Age Research

INTRODUCTION

1. The Foundation for Age Research (succeeding Age Action Trust set up in 1976), was established in 1978 with the aim of funding medical and scientific research into the ageing process and the disabilities of the elderly. It is a member of the Association of Medical Research Charities and is the only charity concerned exclusively with furthering research into the problems of old age.

2. In the past eight years the Foundation has committed nearly £1.2 million in support of research projects; commitment in 1986–7 was £181,030. The money to fund research has been raised from grant-making Trusts, companies and individuals, the Foundation ensuring that donations are put to the best use.

3. The Foundation has paid particular attention to four fields of research which are of great importance to the elderly. These are incontinence, dementia, mobility and nutrition. Attention is now being increasingly directed to the fundamental biological problems associated with ageing. It may be that the underlying process of ageing is due to one or a small number of causes. If this is so, fundamental studies of the ageing process, per se, become extremely important. They will not only throw light on the origins of many age related diseases but, since these are seen as separate problems, such studies will help to coordinate all the separate research programmes which exist at present. A better understanding of the *causes* of age related diseases would be of enormous benefit.

4. The Research Committee of the Foundation, composed of clinicians in academic departments of geriatric medicine and scientists engaged in biological research, selects projects for support, always seeking excellence and taking into account subject, cost and likelihood of successful conclusion. The Foundation prefers to support projects which are unlikely to be supported by other grant giving bodies.

5. In all, 65 projects have been financed since 1979 of which 23 are current and 42 completed. A list of references to published work resulting from these projects is attached [*not printed*].

6. Besides direct support of research projects, the Foundation regards the education and training of research workers as very important. It now funds 12 studentships to allow promising young scientists to be trained in research methods in established university departments. Only if such opportunities are available will such people be encouraged to make old age their field. Without this interest research will not prosper.

7. The Foundation wishes to underline four topics which are set out on the following pages and which are a matter of great concern. These topics are:

(a) the ageing population;

(b) funding of research;

(c) career structure;

(d) education.

These relate to your specific questions (a), (c), (d) and (h).

THE AGEING POPULATION

8. A large proportion of health and social care is now devoted to the elderly. The numbers and proportion of old people in the population has risen throughout this country so that now 15 per cent are over 65. There are 9.8 million people of pensionable age. Projections suggest that the numbers of those over 65 will not now change significantly by the end of the century but the proportion of the very old will increase (1,014,000 over 85 in 2003 compared with 565,000 in 1981). In the future, even greater disability and need will be found among the increased number of the very old. If only the Foundation's priority subjects are examined, it has been estimated that some two million people are incontinent; that some 20 per cent of the population over 80 show evidence of dementia; that the prevalance of fractures of the neck of the femur (an enormous surgical commitment) rises to 25 per 1,000 of those over 85; that nutritional deficiencies are mainly found among the household elderly; and, finally, that 60 per cent of hospital admissions are of those over 65 where length of stay is naturally longer than that of younger patients.

9. With these changes in the age of the population, changed patterns of diseases have become apparent with an increasing incidence of "degenerative" diseases and accompanying longstanding disability. We

cannot, therefore, stress too strongly that the increase in the age of the population has not been matched by a comparable increase of research into the problems of old age.

FUNDING OF RESEARCH

10. The Medical Research Council will put its own strong case for funding which may well be general and not particularly devoted to the problems of the elderly. Since 1976 it has devoted considerable resources to Alzheimer's disease and, of course, much of its work in biological and medical research is of importance to the old. There is no doubt about the excellence of this work but the MRC has no Division devoted to ageing or gerontology and has paid piecemeal attention to old age rather than having a specific commitment.

11. The DHSS is in the best position to conduct operational research. Commercial interests are mainly concerned with drugs for which the elderly present a huge market.

12. Charities are a "growth market" and are being increasingly established to meet the needs of present society. Some are concerned with specific diseases where the elderly form a significant proportion of the sufferers. The Foundation, specifically concerned with the causes and results of old age, has only, for example, been able to plan funding for six of the 67 projects recently submitted to its Medical & Scientific Research Committee for commencement in 1987–88. To these should be added four post graduate research studentships due to start on 1 October 1987 and currently costed at £72,000. Donors, of course, with or without encouragement, can call the tune and it will be no surprise, in view of its frequency and catastrophic effects, that dementia is the most commonly supported of the Foundation's interests. Age in comparison (and competition) with other causes is not as popular/emotive as some subjects and, since funds are so limited, the Foundation can only support comparatively short term projects. It should be noted that (a) no project is permitted to start unless money has been accumulated to fund it to conclusion; and (b) income is always uncertain and the bigger donors often like to select a specific project for support.

13. Doubtless there is an immeasurable scope for an increase in the amount of research which increased funding would make possible. However, any increase in gifts to Charity should not serve as an excuse for a reduction in Government funding.

CAREER STRUCTURE

14. The career structure in research is considered to be inadequate. There is no recognised ladder to be climbed (excluding MRC and University appointments) and the recently qualified scientist too often has to seek what post he can, involving short term grants, and may well be eventually lost to medical science. For the young research worker completing, perhaps, one of the Foundation's studentships, prospects are very uncertain. In addition, the SERC restricts its post-doctoral fellowships to people under 28 and allows them only to be funded once. There is, moreover, no career structure for the non-clinical scientist working in a clinical department. Too often, those in their thirties find there is no post to fill.

15. For medical graduates, the situation is complicated by the length of the degree course, the pre-registration year, the study for higher qualifications and the increasingly complicated and rigid requirements for specialisation. Thus, medical graduates may be in their late twenties or early thirties before they are ready to participate in full time or nearly full time research. At this time they are pre-occupied with the requirements of specialty training which allows a restricted time for research and usually, unless they are ambitious for an academic career, the research they do is short term and designed to lead to a higher degree.

16. Because of funding restrictions, academic posts are becoming rarer while the review of hospital staffing may reduce the number of senior registrar and registrar posts and hence the total pool of medical researchers. The opportunities for young doctors to step off the ladder temporarily to carry out research are likely to diminish. A review of career prospects and its financial rewards would seem to be very necessary if young and able people are to feel encouraged to enter the field.

EDUCATION

17. Clinical academic departments of geriatric medicine are comparatively new and the amount of teaching that they provide for medical students, though increasing quite rapidly, varies widely between medical schools. They require the educational impetus of on-going research, and opportunities for this which are taken for granted in longer established disciplines. Teaching of the more basic and scientific aspects of old age is very limited indeed and teachers who are familiar with research in these aspects are needed. Medical students are taught against a background of research in most subjects and this should be as evident in departments of geriatric medicine as in other clinical departments.

We shall be pleased to provide further information relating to any of the points made above.

John Allfrey, Director
British Foundation for Age Research

May 1987

Memorandum by the Foundation for the Study of Infant Deaths

The Foundation's involvement in research, and outline of programmes and priorities

The Foundation for the Study of Infant Deaths funds scientific research into the associations, possible causes, and prevention of the sudden and unexpected deaths in infancy for which no adequate explanation is found at post-mortem examination. Some 1,500 deaths of this kind occur in the United Kingdom each year. Since its inception in 1971 the Foundation has given over two million pounds to support such research.

The nature of the deaths suggests sudden malfunction of breathing or heart action, and over one third of the resources has been devoted to physiological studies involving the heart and lungs, including the development of normal stable breathing patterns in infancy. Another third has been given to epidemiological and preventive studies, and the remainder to miscellaneous projects which include pathological studies, and investigations into the possible role of infection in causation.

Answers to the posed nine questions are given in the context of the Foundation's work.

(a) A charity such as the Foundation which receives applications for financial support for research projects, relies on its medical advisers (a Scientific Advisory Committee) to set research priorities. These priorities tend to be governed by the applications received, the sums requested for research usually exceeding the amount of money available. In theory it is the excellence or otherwise of these applications which will determine whether the research work is recommended and given support. In practice, "excellence" is that perceived by the medical advisers, and therefore a category that is determined by the latter's impartiality and scientific integrity.

There can be no absolute guarantee that grant applications received will reflect the particular needs of National Health Service/the nation in the particular sphere of sudden and unexpected infant deaths. The medical advisers are at liberty to suggest areas for research which they see as true priorities, but which do not necessarily attract grant applications. They could then suggest that accredited research workers be invited to undertake such work and recommend them for funding. This rarely happens in practice.

(b) The Foundation's prime concern with sudden and unexpected death in infancy inevitably embraces many branches of medicine. These include developmental physiology, developmental pathology, developmental biochemistry and inherited metabolic disease, social, preventive and community medicine, infectious diseases, and psychological and psychiatric medicine. Some of these disciplines attract more doctors than others, and those more sparsely doctored tend to be underrepresented in research applications. In the sphere of sudden and unexplained infant deaths this is particularly noticeable with regard to two disciplines. The first is pathology, where the relatively small number of individuals involved in the pathology of this age group are overwhelmed by the burden of routine work (see also (i) below). Sudden infant death syndrome is a diagnosis of exclusion and relies heavily on the standard of the post-mortem examination for its accuracy. The second is psychiatry. The effects of the bereavement on the families with regard to their subsequent physical and mental health, and research into effective ways of sustaining them have attracted little serious scientific attention. A third discipline—community paediatrics—has, with notable exceptions in a handful of health authorities, shown little research curiosity about a subject which should be one of its particular concerns. It is, however, uncertain how far priorities would change with increased resources.

(c) As mentioned in (a) above, individual research workers perceived as excellent by the medical advisers, tend to set the priorities. They are usually not slow to move into areas involving new technology. Since these areas are often the most expensive to fund this may sometimes be to the detriment of priorities in some of the disciplines mentioned under (b) and in social and preventive medicine, and these may also be less likely to attract able young research workers.

(d) Charities specifically targeting on one area such as the Foundation for the Study of Infant Deaths influence priorities indirectly through their medical advisers—through their perception of the value of research applications. The priorities will only change with the awareness of the advisers themselves. Thus it is in the interest of such bodies to have a broadly based panel of advisers, and one which is not allowed to stagnate over the years.

(e) If the results of research are worth publishing, they will be published. This does not necessarily mean that they will be widely read or assimilated. Charities such as the Foundation also keep their supporters abreast of research results via regular newsletters and meetings, but the same provisos must hold.

(f) As the Foundation is the major source of funds for research into sudden unexpected infant death there is less likelihood of research effort in the field being duplicated. In certain areas some duplication may be desirable, for confirmation of unusual or unexpected results.

(g) Only in the very few health authorities where infant mortality has fallen parallel with the research using health care intervention. The implementation of important research results into improved

health care has elsewhere lagged behind. This may be because some of the important epidemiological research results have their application in the social and preventive field.

(h) It is not so much the *training* of medical research workers that may need changing but rather their horizons as to what is basically important. This may need a fundamental restructuring of the undergraduate curriculum. The importance of the basic instillation of scientific methods into young research workers, and their close supervision while carrying out research though, must not be underestimated.

(i) Certain areas of medicine which overwhelmingly need good basic research are so understaffed that those doctors working in them have neither time nor energy left over from arduous routine duties to give to its organisation or practice. One in particular affecting the field of sudden and unexpected deaths, and already mentioned under (b) is that of the pathology of the foetus and infant. This country has at the moment no single academic unit dealing in the pathology of this time of life, when mortality is higher than at any time in the subsequent 50 years or so. (Nor does it have an academic unit of paediatric pathology in general.) The need for the establishment of such units to attract and train young pathologists, and to initiate research, is surely paramount.

April 1987

Memoranda by Mr J G Fraser and Mr J W P Hazell of the University College Hospital and Royal National Institute for the Deaf Cochlear Implant Programme

UCH/RNID Cochlear Implant Programme

I am writing as spokesman for a group of scientists and doctors concerned with the development of cochlear implants in this country. This is a type of hearing aid which is inserted by means of an operation for those who have a total cochlear deafness.

There are government research programmes into cochlear implantation in the United States, West Germany, France, Austria and Australia but there has been no DHSS support in the United Kingdom. The DHSS did set up a working party which reported in 1978[1] recommending that centres should be established in this country. We applied for funding ourselves in 1982 without success.

Since the DHSS working party reported, the evidence from other countries makes it clear that cochlear implants are of great benefit and relatively complication free. Our own programme is supported by private funding of limited duration but other centres in this country have been unable to proceed with their planned research because they have been unable to get it funded.

There is a particular question for your Committee to address, and that is, how the DHSS could set up a working party on cochlear implants, and then totally ignore its recommendations?

As far as priorities are concerned, in the case of cochlear implants, Professor Haggard of the Institute of Hearing Research would be able to give evidence on the incidence of profound hearing loss not helped by hearing aids.

April 1987

Tinnitus Research at RNID/UCH

This research programme has been in operation since 1974. A tinnitus research clinic treating patients has been operating weekly at University College Hospital since 1977 under my direction. I organised a multi-centric trial of treatment with tinnitus maskers which resulted in a DHSS report in 1985. The response of the Department was dismissive and disinterested. Nevertheless, between eight and nine million people in this country suffer severely from tinnitus (MRC Institute of Hearing Research Epidemiological Studies) and as a result of our work there are now more than thirty tinnitus clinics operating around the country, most of them in great financial difficulty.

After the DHSS report was submitted I received £40,000 towards the annual running costs of the clinic. The following year responsibility was "devolved" to the district health authority and since then the clinic has been unfunded. We operate a clandestine service based on cross-accounting to other DHAs getting patients to pay for their own treatment.

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[1]Ballantyne J C, Evans E F, Morrison A W, (1978): "Electrical Auditory Stimulation in the Management of Profound Hearing Loss". *Journal of Laryngology and Otology October Supplement 1.*

I will continue to work on research in this field and we have currently an exciting programme of electrical suppression of severe tinnitus using cochlear implants. Seven patients have already been treated and studied and we have had three very good responses.

My experiences with the DHSS have led to total disillusionment. It seems that the purpose of funding research is to give the impression that something is being done about the many medical problems in this country, but most of the recommendations of these projects are ignored by the DHSS in the long term, particularly if they involve any resource implications.

The DHSS is now able to reply favourably to any research project, complimenting it and commending it, but at the same time saying that any expenditure for the clinical implementation of the new procedure must be met out of local district health authority funding.

My own tinnitus clinic only came into being as the result of a successful research project. It now only receives tertiary referrals from other consultants around the country. However, it is impossible to have the clinic established as a supra-regional speciality or receive funds from central sources. My experience is hardly unique. It is in my view the most damaging to prospects of new research in this country. Few people are willing to devote personal time and effort (which research always involves) if they know that the techniques are never to be exploited because of funding restrictions.

I will endeavour to answer the questions in your letter of 3 March:

(a) Priorities for medical research are set by patient demand. Where there is an overwhelming demand for treatment or management of a particular condition for which there is very little one can do, this acts as a prime stimulus to find new methods of treatment. There has often been considerable weighting given to those conditions which are life-threatening, rather than those which simply destroy the quality of life. Most research is done by a numerically small group of doctors. There is no way that their interests could be representative of the general needs of the nation's health. Their interests reflect their own personal interests. You cannot force people to do research in areas in which they may have expertise.

(b) It is difficult to comment on areas outside one's own field. Naturally we feel that an area relating to deafness and other hearing disorders such as tinnitus should be given a higher priority, as the priority it is currently afforded is virtually zero. Bearing in mind that between eight and nine million people are affected in this country, these priorities need to be adjusted, however limited the resources.

(c) Undoubtedly!

(d) Speaking for the Institution that provides most of my support, The Royal National Institute for the Deaf, it has in the past been motivated by the requests, and indeed demands, of those people who use its services, and write regularly to it etc. There should be far more coordination between public bodies and charitable ones, and one certainly gets the impression that the charities are having to take over the lion's share of what used to be Government responsibility.

(e) The results of research are invariably reported in the professional journals, and this is the correct way to do it. The practice of reporting your pilot study in the national press may attract a lot of initial public interest, and even perhaps private funding, but our experience has been that such projects have less long term potential.

(f) It is important to remember that duplication of research effort should not always be avoided. Where vital issues are being debated, I feel more and more that it is important that results should be checked by independent bodies. Nevertheless much can be gained by sharing information at an early stage in research and in this respect direct access to the North American literature databases are invaluable (via Dialogue or Knowledge Index).

(g) Again, much research flounders because once the project is finished there is no finance to support the cost of new clinical treatments. It depends whether the DHSS is more interested in defending itself against the possibilities of resource implications increasing, or whether it really cares about the development of new and better techniques for patient care.

(h) Most medical researchers receive very little training in research techniques, and have to pick it up as they go along. Although many universities provide services for data analysis and statistics, these are variable and personnel are often short. My most valuable information when I started medical research was gleaned from a morning generously donated by one of the editors of "Which" magazine.

(i) Needless to say what is needed is more funding, and it is important to remember the impact of medical research "inflation" which may be running at between 30 and 50 per cent in terms of equipment.

I am sure many of these comments are self-evident and will have been made by others submitting evidence to this Committee. I do hope the Committee is able to produce some real recommendations, particularly about the implementation of new research techniques.

April 1987

Letter from Professor Paul Freeling, Special Advisory Committee in General Practice, University of London

I am the Chairman of the Special Advisory Committee in General Practice of the University of London.

The Committee has requested me to write to you. I am aware that your letter of 23 March 1987 gave a closing date of 30 April for receiving evidence. My colleagues hope, nevertheless, that you will be able to consider our comments. We know that you have received evidence from the Association of University Teachers in General Practice and I will try to avoid duplicating that evidence. There are a number of points which we wish to make which are related in part at least to our involvement in the provision of care in Inner London.

You pose nine inter-related questions on behalf of your Committee. When considering any of these questions it seems to us important to distinguish between basic and applied research and between bio-medical and socio-behavioural research. A good deal of research into primary care in Inner London is, of necessity, applied and has a large socio-behavioural component. In particular this is true of attempts to experiment with and to evaluate different types of service provision. When conducting such research it is often necessary to seek funding simultaneously for the service and for its evaluation. Few research funders will fund the intervention, few service funders will fund a proper evaluation. A consequence is that service provision in the inner city remains of doubtful quality and appropriateness.

This difficulty reflects the tendency for a funding body to support research the shape of which they find familiar. This is not always a weakness, but it can be constraining. In particular, it may not be recognised that building up methodological skills in a research unit is as essential in the kind of work needed in primary care as it is in a laboratory-based discipline. The absence of machines does not mean an absence of skills.

Finally, a great deal of research funding seems to be responsive rather than pro-active. One can understand the need for charitable funding to be concerned with subjects the drama of which attracts the public, and one can understand equally, that commercial firms must justify their research expenditure in commercial terms. If a balance is to be held between dramatic research (such as miracle cancer cures) and research of a more tedious kind (how to reduce accidents in the home, for instance) then it will be necessary for Government to hold the scales. There is a Research Advisory Group in Primary Care at the DHSS and I belong to it. Sadly, it seems to meet with decreasing frequency, perhaps because funds are not available to implement its suggestions. If Government seeks to make short-term political capital out of funding research it will be self-defeating, and for this reason it might be best for research planning to be based in some Government Department other than the DHSS or DES.

August 1987

Letter from the General Medical Council

I enclose a memorandum of evidence to Sub-Committee II (Medical Research) of the Science and Technology Committee of the House of Lords. The memorandum was prepared by direction of the Chairman of the Education Committee and the President of the Council for consideration by the Education Committee at its meeting on 29 April. A wide range of opinion was expressed within the Committee on the questions posed by the Sub-Committee but, unfortunately pressure of time and other business precluded a full debate. In these circumstances I have been asked to send the memorandum, in order to meet your Sub-Committee's deadline, and to request that this explanation of its status be forwarded to the Sub-Committee together with the memorandum.

P L Towers
Registrar

April 1987

THE ROLE OF THE EDUCATION COMMITTEE OF THE GENERAL MEDICAL COUNCIL

1. The Medical Act 1983 gives to the Education Committee of the Council statutory responsibility for promoting high standards of medical education and for coordinating all stages of medical education. It also empowers the Committee to embody its determinations on educational matters in "Recommendations" to the Universities and other bodies concerned with medical education.

2. The importance attached by the Education Committee to research is reflected in its Recommendations on all stages of medical education, from undergraduate to the training of specialists.

3. The current (1980) Recommendations on Basic Medical Education include among the aims of this stage of education the development by students of attitudes appropriate to the practice of medicine. These include an ability to recognise their obligation to contribute if they can to the progress of medicine and to new knowledge, and to assess the reliability of evidence and the relevance of scientific knowledge, to reach conclusions by logical deduction or by experiment, and to evaluate critically methods and standards of medical practice. The means whereby these abilities, and the ability to work independently, may be fostered are elaborated in the following paragraphs of the Recommendations:

> "30. the Council sees considerable advantage in offering opportunities for special study during the undergraduate period. Such opportunities may take the form of participation in research projects under supervision, of the preparation of essays or dissertations, of elective periods during which a variety of optional topics of study may be undertaken, or of intercalated years of study leading to Honours BSc, BA or BMedSci degrees.
>
> 31. The Council has received favourable reports of the value of intercalated years of study which are offered by many Medical Schools. These may provide opportunities to study in depth one of the medical sciences, or topics in clinical or laboratory medicine. In many Medical Schools it is not always necessary for such years of study to be undertaken at the somewhat artificial moment of division between so-called pre-clinical and clinical periods of study.
>
> The pursuance of study in greater depth in a selected area or of a particular topic will not only bring the student into closer contact with members of staff but will allow him, with the incentive of his own interest, to learn to think scientifically in a field whose elements he has already assimilated. Such special experience judiciously planned and employed, although confined to one discipline or to selected fields of limited scope, has a general educational value which frequently increases the student's appetite for knowledge, his capacity to learn and his power to think clearly and to some purpose.
>
> 32. Elective periods occurring within the normal curriculum, as distinct from intercalated years, can also be used for study in depth. They provide a useful opportunity for the student to engage in laboratory or clinical research or to obtain additional clinical experience in a particular field, whether in Britain or overseas, in different systems of health care.

The Committee views with concern the diminishing numbers of grants for intercalated BSc, BA or BMedSci degrees, and intends to review this position in the autumn."

4. After obtaining full registration, the majority of young doctors will commence some form of specialist training. The Education Committee has recently issued draft Recommendations on the Training of Specialists which contain the following paragraphs about the relevance of research to training in all specialties:

> "44. All programmes for training in clinical specialties should give trainees knowledge and understanding of research methods, because this will develop their capacity for critical thought, accurate measurement, organising and ordering data, the weighing of evidence, and presenting material to others, orally or in writing. This will enhance their clinical practice.
>
> 45. Research may be undertaken during in-service clinical training, but some trainees will show greater aptitude for research than others. Programmes for all stages of specialist training should be as flexible as possible to accommodate and recognise, on an individual basis, experience in research. The value of any research work will, however, be limited unless the trainee enjoys the supervision of stimulating and experienced clinical and/or basic scientific researchers."

5. The draft Recommendations on the Training of Specialists also contain the Committee's views on the attributes of the independent medical practitioner, who has completed specialist training, which include:

> "Recognition of the opportunities and duty to contribute, when possible, to the advancement of medical knowlege and skill, which entails:
>
> (a) understanding of the contribution of research methods to the doctor's own clinical or other specialist practice;
>
> (b) understanding, interpretation and application of others' research in the doctor's own specialist field, and

(c) acceptance of the responsibility, when appropriate, to contribute to clinical, laboratory-based or other research in the doctor's specialist field, through personal participation and/or through encouraging participation by trainees in such research programmes."

QUESTIONS POSED BY THE SUB-COMMITTEE

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

The Medical Research Council and comparable organisations, in consultation with the Health Departments, assess the priorities both in the basic sciences and in relation to clinical/applied research, and therefore take account of the health needs of the nation.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

The present balance between the different branches of medical research is right, but there is growing evidence that investment in basic research, as well as in clinical research, has been cut back beyond the safe level. Not only have cuts in funds available to the Medical Research Council obliged it to refuse high quality, high priority, research grant applications, but the failure of the Government to supplement nationally agreed salary increases has contributed to the need to modify the priorities. Hence not all high priority, good quality, research can now be supported. Furthermore, evidence available to the Committee from Universities has indicated that the increasing patient load and teaching commitments are being met at the expense of time spent on research. Meanwhile, clinical research has also been seriously eroded by financial cutbacks and is likely in the future also to be damaged if present medical manpower polices are rigidly implemented. Clinical knowledge, understanding and skill provide a unique foundation for undertaking research into health and disease in humans.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

Priorities are influenced by, and have to adapt to, changing patterns of disease. AIDS is an obvious current example, and resources are being diverted into research in virology because of this new and devastating disease which has only recently emerged. There is, however, no significant amount of research into the problems of illness in old age, despite the changing population structure. There would also be advantage in the development of further research into general practice, the delivery of health care, health education and the medical role within it, and into medical education itself.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding or research affect the setting of priorities by the different institutions involved?*

Priorities in medical research are influenced to some extent by the efforts of charities and similar foundations, which raise funds specifically to ensure appropriate support for the research which they wish to be undertaken. Without their efforts, insufficient resources would be available. The major independent funding organisations, such as the Medical Research Council and the Wellcome Trust, can then assess the overall picture and take account of fields less well supported by voluntary funds. Cancer research, for example, is well supported by voluntary bodies and the independent organisations have found it necessary to provide relatively little support in this area. However, the Government would be unwise to rely on private funding, since there are a number of fields which do not receive much voluntary support. These include molecular biology, research into which has led to substantial developments in the treatment of disease, such as the advances in the prevention of genetically determined diseases (such as haemophilia, Huntington's Chorea and muscular dystrophy), resulting from DNA recombinant studies. Other examples include developments in treatment of Parkinson's disease, which result from fundamental scientific work on neurotransmitters, transplantation programmes which have been made possible by basic laboratory research in immunology, the vast improvements in imaging of human tissues, which have been made possible by developments in physics, and the need to sustain psychobiological approaches to research in the field of mental illness.

(e) *Are the results of research adequately disseminated?*

The results of research are more than adequately disseminated—indeed doctors experience problems in coping with the resulting information explosion. In addition to "Health Trends", the DHSS might consider issuing a news sheet with brief statements about the principal developments with practical implications which have recently occurred in the major fields of research. Similar action might be taken by the other health departments.

(f) *How is unnecessary duplication of research effort avoided?*

Although the Council is not aware of significant, unnecessary duplication of research work in the United Kingdom, there is no national machinery to ensure that such duplication is avoided.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

Lack of resources militates against improvements in patient care or health education as the result of research. For example, the immense potential improvements in medical care and reduction of human suffering resulting from CT scanning, and more recently from NMR scanning as well as from the prevention of inherited disease by DNA technology cannot yet be realised in the United Kingdom, on a nationwide basis, for lack of money.

(h) *What changes in the priorities of medical researchers are needed?*

No changes of this kind are needed, but there should be a better career structure, together with incentives for medical researchers. There is, for example, no career structure for basic scientists working in medical clinical departments. If academic medicine in all its forms, including medical research, is not to wither, the factors which militate against recruitment to academic medicine should be removed. At present, many incentives are directed towards NHS consultant practice and private medical practice, and away from recruitment to academic medicine, whose future is essential to the maintenance of standards of medical education.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

It is important to ensure adequate, well directed, funding for areas of research which are crucial to the health and well being of the community.

Letter from Professor D G Harnden, Paterson Institute for Cancer Research

I have just returned from a meeting of the MRC Cell Board and I am compelled to write to you as a member of the House of Lords Select Committee on Science and Technology to tell you of the really disastrous financial state of affairs which exists at present within the MRC. You may well already be aware of this from other sources but I feel that it is important that you should hear the views of someone, not in the MRC employ, but involved as an outside expert in their scientific review system.

It has been clear since I joined the Board last October that the financial contraints were considerable. Indeed I was warned by MRC Head Office staff before I accepted a place on the Board that the MRC was being financially squeezed by 2 per cent per annum in real terms. I was not too surprised therefore to find that projects of high scientific merit were being assessed as "approved but not funded". This is a serious situation but given that the most outstanding projects were still being funded it was just possible to accept. Furthermore, at meetings in October and December we were forced to defer decisions on *programme* grants of outstanding merit because we were not sure that funds available for the rest of the year would cover these as well as other prestigious projects which might come forward at subsequent meetings.

At the opening of the meeting we were informed by MRC Head Office staff that the money which we had previously been told would be available for the next financial year had been cut by approximately 30 per cent. This was felt to be necessary because the recent pay award to University staff would have such an impact on the MRC financial position, that in the absence of any assurance that further monies would become available, immediate constraint was essential. (Two important points should be noted in passing. First the pay award which is equivalent to approximately 5.8 per cent per annum over three years does not in any way redress the loss of 20 per cent or more in the value of academic salaries over the past five years and can in no way be considered excessive or even generous. Second, the MRC had very prudently set aside substantial sums from their own resources to meet an anticipated pay award but were caught unawares by the failure of government to provide any of the additional support required.)

It became apparent at the outset of the meeting that with a backlog of good projects and programmes as yet unfunded, together with the best of the programmes before us today, we were faced with a situation where we would have to turn down even the very best proposals if we were to operate within the financial limits being set.

I must stress that the Council has so far conducted its business (as observed from the Cell Board) in a most prudent and responsible manner.

The mood of the Cell Board at this meeting, however, was one of open rebellion. Mass resignation was discussed but discarded as unproductive. We decided to assess the proposals before us on their scientific merit and then try to come to terms with the financial impact. We passed only a small number of proposals but amongst these were programmes from leading groups.

(1) a molecular genetics proposal from Professor Luzzato at the Hammersmith Hospital;

(2) NMR spectroscopy from Professor Radda in Oxford;

(3) a clinical trial of proton therapy for ocular melanoma at Clatterbridge Hospital; and

(4) the research programme of Dr Ray Calnes's transplant team in Cambridge.

We felt that to recommend that any of these should *not* be funded would be indefensible in scientific and clinical and even moral terms. We had an obligation as scientists and doctors to recommend to the Council that these be funded. In doing this we acted against the advice of the MRC Head Office staff and in the knowledge that in doing so we could be faced with a situation at our next meeting that:

(1) there would be virtually no money to allocate;

(2) projects and programmes of high quality in the pipeline could not even be considered.

If this situation persists the future for biomedical research in the United Kingdom is indeed bleak. We, on the Cell Board, felt impotent to do anything about the situation ourselves. The only way to seek an improvement would be for the Council itself to make representations direct to Government and we have urged them to do so. All the signals we have, however, are that this will meet with an unsympathetic response. The other course is for individual members of the Board to do their best to ensure that this perilous situation comes to the attention of those, not in government, who are in a position to influence matters. Having read the first report of your Committee, (1st Report 1986–87, Civil R&D). I was encouraged to think that you and your colleagues in the Upper House understand the basic problem. I hope this plea for help can be transmitted to your colleagues. The situation is truly desperate.

In conclusion I want to stress one particular point. There is no shortage of good projects in need of funding. We are declining projects and programmes which in previous years would not have been anywhere near the cut off point for funding. Biomedical science is being starved almost to death. Generous support from private funds soften the blow in some areas but when we come close to having to decline a programme grant from possibly the leading transplant team in the world, as we did today, surely something is far wrong.

If I can provide more information I will happily do so. This letter is sent with the knowledge of the Cell Board Chairman Professor Louis Wolpert.

March 1987

Memorandum by Professor J M Harrington, Institute of Occupational Health

Occupational Health Research

(1) *Preamble*

Perhaps it is necessary to justify why the Select Committee should be presented with yet another paper on medical research—particularly one concerned with an apparent minority medical specialty. The justification, in my view, is that occupational health is a neglected area of medicine and that research in this field has received scant attention from Government and Research Councils in the face of other priorities in medicine, notwithstanding the importance of occupational health to the national economy and well-being.

In addition, occupational health research has certain characteristics pertinent to the current debate on research funding in general and the viability of university departments. I shall make use of the recent Advisory Board for the Research Councils (ABRC) Report "A Strategy for the Science Base" and the seven year experience of my own Unit to illustrate aspects of the problems of undertaking occupational health research. This paper will, I hope, persuade the Select Committee to consider that such an area of medical activity can play a significant part in university research as well as the national economy and that the current status of academic departments in this subject warrants a national planning strategy.

(2) *The Nature of Occupational Health Research*

Although occupational health is a practical subject the research remit can be much wider. Within my Department for example, our activities range from basic research into the mechanisms of carcinogens to applied research such as our Carbon Black project (described later).

(3) *Sources of Research Funding*

There are three:

(i) the Medical Research Council is an obvious potential source. In practice this is not to be a fruitful area for us as I will outline later.

(ii) The Health and Safety Executive is viewed as our major source of funding both for basic and applied research. However, an essential remit for the Executive is to set standards for controlling the working environment. It may therefore be less easy to get money for research on, say, a new toxic hazard associated with a known toxic material as a standard may already have been set for its established effects.

(iii) Industry in essence will always want applied research. Increasingly they appear to be prepared to finance it. (See 5.1.)

(4) *The Relevance of Occupational Health Research to Perceived–Current Research Strategy*

The ABRC Report notes a "lack of purposeful direction nationally in the redeployment of university research effort" (1.24). It also sees a need for greater concentration of research effort (1.28 et seq) and better management of research manpower (1.40 et seq). One way forward is seen in the establishment of interdisciplinary centres of excellence which are "mission-orientated" (1.45). Research should be viewed at least in part by external criteria of exploitability and applicability (2.15), whilst little attention has been paid as yet by the Research Councils to involvement in EC funded research (2.37). Industry and government funded research, nevertheless, is often inadequately costed for overheads and this can lead to industrial sponsors being frightened off projects by the in-built costs (Annex A).

In my view, a good occupational health department in a university should fulfil the desiderata outlined in the previous paragraph. Occupational health is not just medicine. It is a multidisciplinary subject encompassing the expertise of physicians, nurses, toxicologists, engineers, statisticians and behavioural scientists and this must be reflected in research staff profiles in this field. Much of the research that we undertake is not only "mission-orientated", but it is also industry sponsored or supported. Clearly applicability, and sometimes, even exploitability are important considerations. Occupational health, is, if nothing else, a practical subject.

(5) *The Institute's Research Profile*

(i) Industry-sponsored research

Several of our recent research awards are international in scope. Two industry-financed research projects are of this ilk. One on ceramic fibres involves seven plants in three EC countries (and is a collaborative exercise with our colleagues at the Institute of Occupational Medicine, Edinburgh and the London School of Hygiene and Tropical Medicine). The other, on carbon black, spans 17 plants in six EC countries plus Sweden. Each study has objectives on health hazard evaluation which are vital to the industries covered. They both received stringent research methodology and financial scrutiny within the funding consortia before being awarded. If Phase 1 of the carbon black project is shown to be successful over three years, it will be extended for a decade—with a research revenue to the Institute of approximately £1 million. Such studies are self-consuming in terms of funding however, and as none of the staff involved has core funding, their contracts will terminate with the end of the study. In addition, shorter term contracts (we have two with the DHSS) present more acute problems for excellent junior researchers regarding continuity of employment and career development.

(ii) Health and Safety Executive Research

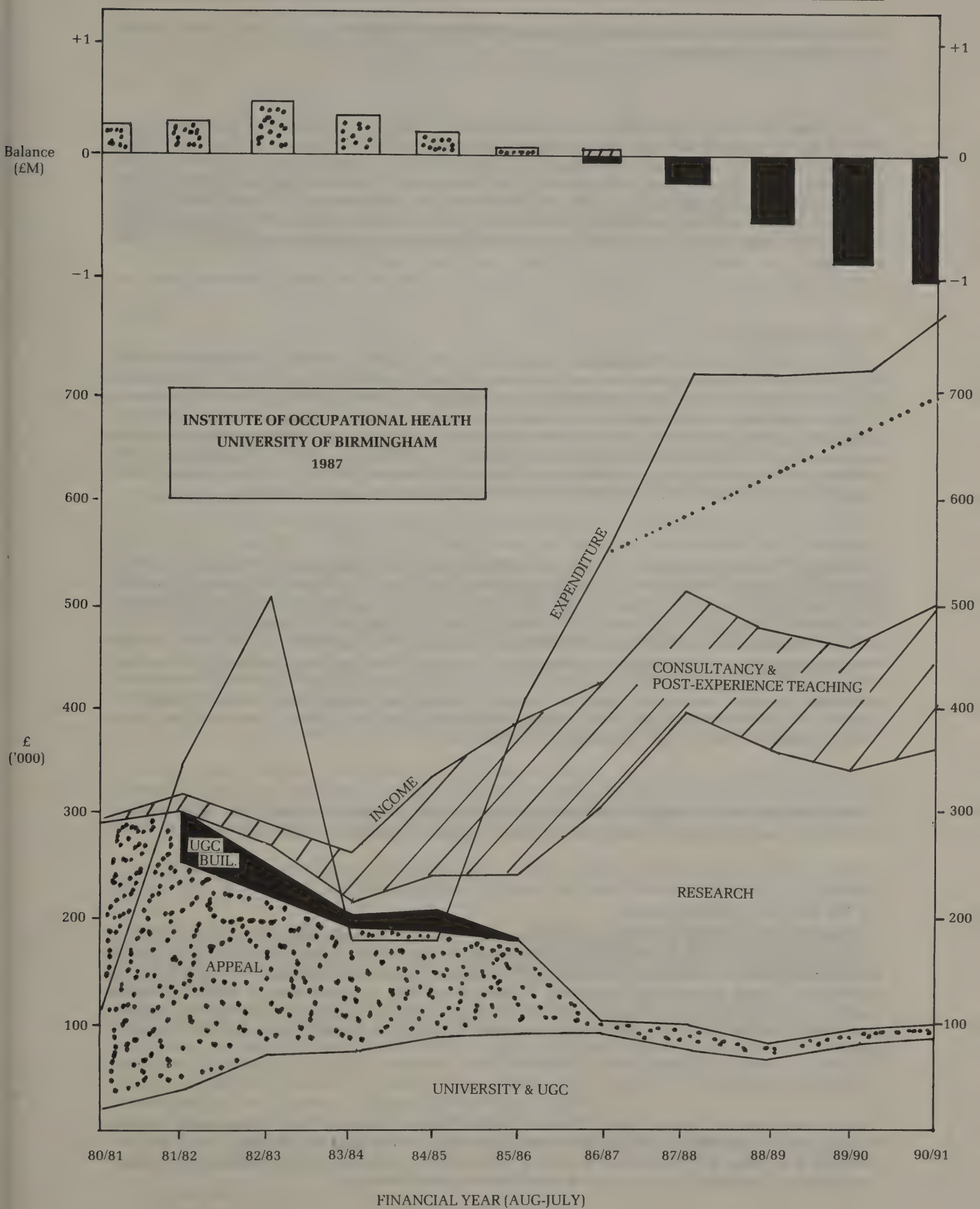
The Health and Safety Executive is viewed by us as the major source of research funding. The Executive, whose total research budget is less than £1.4 million, has, in line with Recommendation 13.19 of the House of Lords Select Committee Report on Occupational Health and Hygiene Services (2nd report, Session 1983–84), awarded by open competition two three-year research projects from the extra mural section of its budget. We have a one-third stake in the first on Repetitive Strain Injuries and we have the whole of the second concerned with neuropsychological aspects of solvent exposure. The Institute is not bidding for the third project on back pain as we do not have the relevant in-house expertise—neither, at present, do we have the core funding necessary to provide the senior academic staff to supervise a further major project.

(iii) MRC Funded Research

We have never received any grants from the Medical Research Council. Two applications were turned down, apparently on staff costs, though scientific and research excellence may have been factors. In practical terms for a practical subject, we do not perceive the MRC as a fruitful source of research funds.

(6) *The Financial Status of the Institute*

On the face of it, as a new department, we have a vigorous, young, multidisciplinary team working on project-orientated research with £1.3 million of research contracts to fulfil in the next four years. We are fulfilling our own objectives as well as those indicated in the ABRC report so far as our research activities are concerned. In terms of a relevant and hardworking department, I could not ask my staff to do more. In addition, we provide advice on a consultancy basis and organise a large number of post experience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INSTITUTE OF OCCUPATIONAL HEALTH
UNIVERSITY OF BIRMINGHAM
1987
EXPENDITURE
INCOME
CONSULTANCY &
POST-EXPERIENCE TEACHING
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FINANCIAL YEAR (AUG-JULY)

training courses which provide a steady revenue to the Institute currently equal to, but soon to exceed, the UGC financial commitment.

Yet, in spite of all this, the financial future is not good. A graphical representation of the position from 1980 to 1991 is appended with the table of figures. The Institute started as a joint local charity/University initiative followed by a national appeal chaired by Sir Alex Jarratt. These "pump priming" funds have dwindled of late as industry does not perceive itself as a maintainer of academic departments. Some modest expansion is planned to provide a toxicological information and risk assessment unit but even if this goes ahead the Institute will be £1 million in deficit by 1990–91. Without the planned 1987–88 expansion the expenditure (—expressed as a dotted line—) is less steeply upward but the deficit would still be potentially crippling.

(7) *The National Scene*

I have, thus far, given a Birmingham perspective on the plight of academic occupational health. Regardless of the financial picture, we are flourishing in research as well as teaching (an MSc course is planned for 1989 and more doctoral students are coming) but we lack core funding of senior posts which is vital to long-term research supervision and execution as well as overall planning. The only "tenured" UGC post is mine, though we have four other accredited specialists in occupational medicine, hygiene and toxicology. Further details of the Institute's activities are contained in the Sixth Annual Report. Our problems are clearly not going to be identical to those of other centres that carry out occupational health research but the outcome will be the same unless a strategy is employed to avoid decline.

Although I have no mandate to review the national scene, our colleagues at the London School of Hygiene and Tropical Medicine have staff shortages which are severely disrupting their research activities for the near future, though the London unit undertakes the bulk of national and international teaching. The department in Manchester will lose its Professorial post in October and the remaining handful of the staff will be absorbed into Community Medicine. In Newcastle, the department is even smaller though they have now acquired an excellent toxicologist as Professor. In Scotland, the Institute of Occupational Medicine in Edinburgh justifiably dominates the scene, and in conjunction with the small academic unit in Dundee, provides valuable teaching and training North of the Border. Their research portfolio is, however, the most impressive of all the British departments. Yet their future is uncertain due to the possible changes in their long-term funding from British Coal.

Other relevant centres include the Robens Institute at the University of Surrey and MRC units at Southampton and Carshalton which conduct research related to occupational health issues.

(8) *The Need for a National Strategy*

Academic departments of occupational health provide the basis for sound independent research, teaching and advice. They are, with the Health and Safety Executive, the main resource to which industry should, and frequently does, turn for scientific excellence. The Academic departments are the only source of formal teaching for trainee occupational physicians. Industry needs help to ensure that its workforce remain healthy and that its products are measurably safe. These are essential ingredients in assisting the company to remain profitable for its own and the national weal. They are the ultimate raison d'etre for academic units.

At present, however, to quote para 1.24 of the ABRC Report, there is a "lack of purposeful national direction in the redeployment of university research effort". Some strategic planning and some core financing is required if all these units are not to stumble along, some surviving, some failing, but none really fulfilling the needs of national and international occupational health.

The case for some support for some centres as part of a national strategy to maintain a small but important area of academic medical endeavour is, in my view, overwhelming. That may not be the view of more dispassionate observers on the Select Committee, but I am grateful for the opportunity to put the case.

Actual/Estimated Income for 80/81–90/91

	80/81	*81/82*	*82/83*	*83/84*	*84/85*	*85/86*	*86/87*	*87/88*	*88/89*	*89/90*	*90/91*
	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000	£ 000
Appeal	275	215	143	124	118	67	4	4	4	4	4
UGC for building	—	50	26	12	11	—	—	—	—	—	—
Uni. for equipment	—	—	27	4	10	—	—	—	—	—	—
University revenue + salaries	14	37	47	61	66	86	97	80	79	83	88
Research	—	6	9	1	29	55	218	325	254	255	268
Consultancy/courses	—	—	28	58	82	119	97	111	115	120	126
	289	308	280	260	316	327	416	520	452	462	486

July 1987

Letter from the Health Education Authority

I am responding on behalf of the Health Education Authority to your invitation to submit evidence to the Sub-Committee.

1. The HEA's research activities

The HEA (formerly the Health Education Council) commissions and funds research into the needs of various groups of people for information, advice and education regarding the achievement and maintenance of health (and the prevention of ill-health) and the optimum means of communicating or imparting such health education. The "groups of people" may be sub-groups of the general population (for example schoolchildren; pregnant women; the elderly; Asian immigrants) or professional groups (for example schoolteachers; nurses; doctors; journalists) or statutory bodies (for example health authorities; local and central government). The essence of the research can be summed up as seeking answers to the questions:

(a) *What are the health education messages (regarding, say, smoking, diet, immunisation, AIDS)?*

(b) *Who is/are the priority target group(s)?*

(c) *How can the messages be most effectively and efficiently communicated?*

Thus the HEA's research is not clinical in the classic sense. But we regard it as an important tool in *preventive* health care. Furthermore, as health promotion and health education are increasingly being undertaken by NHS health authorities, more and more of the HEA's research is becoming a form of health service research.

The HEA's research is therefore "applied research" or action-based, being linked to specific operational programmes. For any project or programme the accompanying research is either formative or evaluative.

Formative health education research—addresses (a), (b), and (c) above and includes surveys of health knowledge/attitudes, beliefs and behaviour and falls within the disciplines of the behavioural and social sciences, and community medicine. It also includes pre-testing of educational or campaign materials, advertising, etc.

Evaluative research—attempts to assess the effectiveness and efficiency of health education projects and programmes and consists largely of before/after surveys of the target group's knowledge, attitudes and behaviour regarding the health issue concerned. Such evaluation is often largely qualitative; but may also be quantitative, conforming to the rigour of the controlled trial in which the intervention and control groups differ only in the nature or extent of health education applied.

The HEA's current annual research budget is approximately £750,000 of which the following are the main priority areas:

Smoking education
Diet education
Exercise education
Family and Personal Health education
Alcohol and Drug education

Further details on specific research projects within these areas can be provided on request.

2. Responses to the nine specific questions

(a) *Priorities*

HEA research priority setting is based primarily on an assessment of two main factors:

(i) the size of the health problem—(epidemiological and health service data).

(ii) the extent to which it can be prevented or ameliorated by health education (epidemiological, behavioural science data).

Heart disease provides a classic example of a major health problem which is largely preventable by lifestyle changes (smoking, diet, exercise) encouraged by health education.

However, other influences are inevitably brought to bear, for example how high up the political agenda the issue is; how great the degree of pressure from interested professional and voluntary groups; the extent to which other bodies are providing research money in that particular area, etc.

Wherever possible, health authorities are consulted on forthcoming health education programmes and the relevant research. Close liaison is maintained with the NHS Regions' Health Promotion Group, the Association of District Medical Officers, and District Health Education Officers. Research projects and programmes are selected on the basis of their *relevance* to health promotion as practised in the NHS (by health authorities and primary care professionals) and their "generalisability"(that is how useful the results are likely to be for others working in the field).

The HEA would like to see a greater emphasis on health education research by statutory and voluntary agencies. We would advocate altering the balance in "medical" research from curative clinical and laboratory research towards socio-behavioural and environmental research aimed at preventing ill-health.

(b) *Balance*

Resources for health education are severely constrained, and inevitably this affects the research expenditure and the process for choosing priorities. Apart from the points already made under (a) a crucial question is that of cost-effectiveness. We need to improve our health economics research tools in order to find which projects or programmes are most cost-effective and to divert resources towards them.

Health education programmes have always suffered difficulties in evaluation, particularly in assessing cost-effectiveness. But the same is often true of clinical research. We would argue that a much closer look be given to relative cost-effectiveness in research programmes based on curative as well as preventive activity.

(c) *Adapting to change*

The increasingly elderly population; the expansion of the black and ethnic minorities; the emergence of AIDS; the commitment to cervical and breast cancer screening are all changes that medical research in general and the HEA in particular have had to adapt to. The influences have been referred to as above.

(d) *Funding organisation*

The HEA's research funding is greatly influenced by the funding activities of other organisations. The Authority maintains close links at officer level with many other funding agencies, statutory and voluntary, in an effort to avoid gaps and overlaps. Submitted proposals are often referred to another more relevant agency. The Authority's officers sit on many research grant-giving committees of other organisations. The main area of involvement by the various bodies concerned tends to be arrived at more by a process of trial-and-error than careful coordination, but the latter prevails in some areas, for example cancer education; heart-health education.

(e) *Dissemination, duplication and application*

Despite the above, gaps and overlaps do occur distressingly often and the results of research are often not adequately disseminated, so that work is duplicated or not applied to particular health promotion proposals, plans and programmes. The HEA insists that the results of its funded research is all written up either as papers to be published in learned journals or as reports and monographs to be published by the Authority, or both. The Authority publishes its own journal, the Health Education Journal, as well as a catalogue of research papers. These are distributed to all health authorities in England.

The Authority frequently runs seminars and conferences on research in key areas (for example diet and health; exercise and the elderly; smoking and children) in an effort to disseminate practical findings to those in the field. We have a need for an abstract service specifically for health education/promotion research, along the lines of Index Medicus. This should be an on-line networked service available to a wide variety of professionals, particularly those in the NHS in the primary care and community services settings. This is a function the HEA itself intends to develop.

(f) *Training*

The HEA funds training courses in the principles and practice of health education at Certificate, Diploma and Masters Degree levels. Considerable input has also been directed at teacher-training, nurse-training and medical undergraduate and postgraduate training. At all these levels a scientifically disciplined approach to the research element of health education and health promotion is encouraged. A rapidly growing bibliography on formative and evaluative health education research now exists.

However, much remains to be done to increase the health education research element in professional training. For example, the medical undergraduate curriculum is particularly resistant to the intrusion of such new influences. We would welcome a much broader approach to medical (research) training, taking in such influences as social psychology, anthropology, environmental health and health economics.

(g) *Funding changes*

Unlike the larger research councils, the HEA does not currently benefit under the UGC exemption from university overheads. As a result, our academic research costs are increased by up to 30 per cent (or more in some non-negotiated instances). The UGC itself recommends the imposition of overheads up to 65 per cent on staff costs of research. As a direct result, the HEA has had to cut its grants to academic institutions, and indeed its funds for research in general.

We would like to see a waiving of university overheads charged to smaller grant-giving bodies such as ourselves.

As to coordination, we would like to see more formal research coordination groups in the various key areas of interest; and these should always include where appropriate a health education input.

Spencer Hagard
Chief Executive

April 1987

Memorandum by the Health and Safety Executive

1. This memorandum provides an introduction to the Research and Development sponsored by the Health and Safety Executive (HSE) and then considers the nine specific questions on which the Sub-Committee, have asked for evidence.

INTRODUCTION

2. The HSE has a coordinated programme of research relevant to health and safety at work and the protection of the public from work activities. This programme is designed to support the Health and Safety Commission, the policy and operational branches of HSE and other government departments on all aspects of health and safety arising from work. The programme is undertaken partly by the HSE's own laboratories and research groups, and partly by commissioning work with Research Councils, Universities, Research Associations or undertaking such projects jointly with industry.

3. The medical component of the research programme is primarily concerned with the improvement of occupational health and is administered by HSE Medical Division. The main objectives of the programme are to identify the causes of occupational ill health within the United Kingdom and develop methods for prevention.

4. The intramural component of the medical research programme involves HSE's Epidemiology and Medical Statistics Unit, the Occupational Medicine and Hygiene Laboratory, the Employment Medical Advisory Service and other specialised functions within the organisation. The total resources allocated to the intramural research programmes of the Epidemiology and Medical Statistics Unit and Occupational Medicine and Hygiene Laboratory amount to approximately 15 man-years over a year. There is also an input of about two to three man-years to this research from the Employment Medical Advisory Service and the Executive's psychologist. The extramural biomedical research programme currently spends £1.4 million per annum.

5. The funding for the extramural biomedical research was initially transferred to the Department of Employment from the MRC following the Rothschild Report in 1971 and about 40 per cent of HSE's extramural expenditure on medical research is at present still through the MRC. The research is managed on a customer-contractor principle. This is also the basis for contracting research within the HSE's own laboratories.

6. The research needs of HSE policy and operational divisions (for example the Inspectorates) are coordinated through the HSE research Committee. The Committee establishes research priorities both

within the HSE's workplan and within the Research Programme. This Research Programme is presented annually to the Commission and becomes in effect part of the Comission's plan of work which is submitted to Ministers for approval.

7. Following the recommendations of the House of Lords Select Committee on Occupational Health and Hygiene Services (the Gregson Report) HSE has taken an increasingly active stance with the MRC in establishing priorities for occupational health research within the United Kingdom. This is described below.

The Select Committee's Specific Questions.

(a) *How are priorities for medical research set?*

8. The projects in the HSE's research programme reflect the concerns of the Inspectorates, the Employment Medical Advisory Service, HSE policy branches, the Commission and its Advisory committees. Projects may reflect a need for new information concerning previously unrecognised occupational health hazards (for example from biotechnology, automation, AIDS) or increasing concern about existing problems (for example respiratory hazards in agriculture) or the need for better methods to assess the risks from new substances entering the working environment (for example the development of short term toxicity tests that do not involve the extensive use of animals). Ad hoc groups of experts from within HSE are set up to establish priorities in specific areas, for example to evaluate reports of neuropsychiatric disease in those exposed to industrial solvents and to assess the need for research in these areas.

9. In response to the recommendations of the Gregson Report (para 13.19) the MRC agreed to reconstitute its Environmental Directors' Group so that it could give advice to HSE on occupational health priorities. The new group, now called the Committee on Environmental and Occupational Health, has recently produced a report on "Priorities for Occupational Lung Disease Research" (Appendix 1) and plans to investigate priorities for research into reproductive hazards in the work place.

10. Requests for biomedical research support from the various parts of HSE are collected by the Research and Pathology branch of the Medical Division. These requests are assessed against the intramural programmes of the Epidemiology and Medical Statistics Unit and the Occupational Medicine and Hygiene Laboratory and the known interests of the various MRC Units concerned with occupational health problems. Proposals are presented to the HSE Research Committee with indications of the relative priority given to them by their originators and whether there is capability intramurally to perform the work. The Research Committee agrees the direction and priorities of the whole of the HSE's Research programme which is presented to the Health and Safety Commission for ratification.

11. The structure of HSE enables information concerning occupational health problems coming from its Employment Medical Advisers, Inspectorates, Industry Advisory Committees and Subject Advisory Committees (for example Advisory Committee on Dangerous Pathogens) to be available. This ensures that the research priorities reflect the needs of a wide cross section of the activities of the employed population.

(b) *Is the present balance between different branches of research right?*

12. There is evidence that, as the MRC comes under increasing financial pressure, occupational health research is receiving less funding from the Council. Research in this field is perceived to be of a highly applied and targeted nature, sometimes containing little that is conceptually new. Therefore proposals for project grants in areas of occupational health frequently obtain low scores from MRC grant committees. This may be because the more effective occupational research units have decided that there is little chance of being funded by the Council and apply elsewhere, that is to HSE, industry and various foundations. Although the HSE is not able to fund all its first priority projects this year, high class research proposals have usually been funded.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

13. HSE's research programme is responsive to information from the Commission's Advisory Committees and from HSE Inspectorates, about newly emerging health problems, and changes in technology. Recently the Executive has advertised for proposals and commissioned research into repetitive strain injuries of the upper limb. These injuries are seen especially in industries involving rapid repetitive movements, for example with data entry at computer terminals. Similarly, studies concerning the possible health hazards associated with the use of visual display units are in progress. Psychological effects of chemicals and work practices require increasing attention. Also there is still research to be done on understanding fibre carcinogenicity especially relating to new and allegedly safe substitutes, for asbestos. HSE has also commissioned research on biotechnology safety, which includes work concerned with the development of safe host organisms for genetic manipulation. Following a recent request from the Advisory Committee on Genetic Manipulation the Executive plans to fund a project concerning the safety of handling oncogenes in the laboratory.

(d) *How are priorities influenced by the institutions through which research is funded?*

14. As indicated above (para 12) the highly applied nature of occupational health research is not particularly attractive to the MRC Research Grants Committees. However some funds for academic departments are available from industrial sources. The Executive tries where possible to agree joint funding with industry to encourage more and better occupational health research.

(e) *Are the results of research adequately disseminated?*

15. All HSE Commission holders are expected to publish the results of their research in the open professional literature. Reports of extramural investigations are transmitted to all interested parties within HSE. Abstract reports of all current extramural biomedical projects are collated annually and are circulated within HSE, to the MRC and to the Commission's Medical Advisory Committee (Appendix 2). Intramural investigations are communicated directly to participating parties, for example industry and the workforce; and whenever possible are also published in the scientific and medical literature.

(f) *How is unnecessary duplication of research effort avoided?*

16. In response to the recommendations of the Gregson Report (para 13:19) the Executive has decided to establish a data base of occupational health research within the United Kingdom. We plan to make information from this available on request to organisations outside the HSE.

(g) *Is research reflected . . . in actual improvements in patient care or health education?*

17. The primary objectives of the Executive's research is to support the development of new methods and techniques, new regulations, standards, guidance notes and codes of practice which aim to improve health and safety in the work place. It also serves to improve the effectiveness of inspectors and Employment Medical Advisers in their enforcement and advisory work. Recent examples of advice being developed from our research activities are on violence in the work place, toxicity test methods and the control of asbestos related disease.

(h) *What changes in priorities in the training of medical researchers are needed?*

18. Occupational health research requires input from a variety of medical sciences. These include epidemiology and statistics, psychology, toxicology, experimental pathology, immunology, chemistry and physics. Although scientists from these disciplines are available in MRC Units, some university departments and various institutes (for example the Institute of Occupational Medicine, Edinburgh), there is need for a small number of occupational physicians with training in basic medical sciences and research techniques to act as a bridge between the health problems in the workplace and the skills of the research unit. Their role is crucial in effectively commissioning, monitoring and evaluating research of this kind. Few occupational physicians have had any training in basic research methods.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

19. The major problem in occupational health research is the acute shortage of funding causing problems for the continuity of research programmes and the maintenance of excellent research groups. Most industrial funding is directly targeted to the specific problems of a firm or an industry. The results of many industrial investigations are not available through the open literature or directly to HSE. This is particularly unfortunate because the results from an investigation in one industry are often applicable elsewhere. If adequate support could be made available to the academic departments of occupational health, these departments would be able to form a bridge between the industrial interests and the regulatory authorities. The HSE has a coordinating role and with more funds for research in academic departments could do much to develop the preventative role of occupational health research in the UK.

CONCLUSIONS

20. Occupational health research in the UK has been and is directed to specific problems arising in or emanating from the workplace. There are two consequences from this. On the positive side, the results of this research readily find application in the workplace. However, as this work is seen to be applied and often contains little that is conceptually new it finds difficulty in attracting Research Council funding. There are of course topics of medical research such as fibre carcinogenicity, psychological effects of chemicals and work practices, and the problems of reproductive hazards, that are especially challenging and important to HSE and deserve attention.

HSE Medical Division

April 1987

Memorandum by the Health Visitors' Association

The Health Visitor's Association thanks the Sub-Committee for their invitation to submit evidence on medical research and would like to take this opportunity to draw attention to some deficiencies in research provision within the NHS, notably research into services and nursing. A study of the grant giving of the Medical Research Council in 1984–1985 indicates that emphasis has been placed on medical research into the study of ill health such as the cellular or molecular study of disease, the technology of the identification and diagnosis of disease and the development of new treatment for diseases.

In contrast the amount of funding provided by government to study nursing, midwifery and health visiting practice is minimal. Nursing research is often directly related to patient care, the organisation of services and health education.

In the Association's experience it is extremely difficult for nurses to obtain funding for research into their practice at local, regional and national levels. The result is that nurses have to accept short term funding in the form of awards often provided by commercial companies in order to further their research.

Recommendations

— It is the Association's view that greater financial provision should be made for research into nursing, midwifery and health visiting practice.

— Nurses should be encouraged and assisted to become trained to undertake research and they should be encouraged to disseminate the findings of their research.

— Increased resources are also needed to enable the findings of small research projects to be tested in a wider arena.

The problems encountered in the lack of funds for nursing research are exacerbated by the difficulties experienced by qualified nurses, in particular community nurses, in obtaining accurate and up-to-date information on United Kingdom and international nursing research. The methods for the collection and dissemination of information about current research in the US with respect to nursing and in medical research in general are very well developed compared to the situation for United Kingdom nursing research. The DHSS Nursing Research Index has attempted to overcome the problem of the dissemination of research findings as have the profession's own nursing organisations. In many areas the lack of adequate library services for nurses hampers both the dissemination of information about nursing research and prevents the monitoring of duplication of research effort.

— A more coordinated effort for the dissemination of nursing information is required.

— The establishment of a district library service based on the proposals of the NHS regional libraries group and a DHSS working group[1] must be forwarded with some urgency to ensure that nurses have access to the abstracting and indexing services and other publications they require to keep fully informed of research into nursing practice.

Memorandum by Professor M J R Healy, London School of Hygiene and Tropical Medicine, University of London

I am Professor of Medical Statistics at the London School of Hygiene and Tropical Medicine, London University. Previously I was Head of the Division of Computing and Statistics at the MRC Clinical Research Centre. My training is in mathematics and I am not medically qualified. I have been involved for many years in collaborative research with medical workers in a very wide range of disciplines. My own interests are mainly in the development of methods for interpreting laboratory data, with an emphasis on making best use of the information obtained for diagnostic and other purposes. About half my students enter the pharmaceutical industry, the rest go into some form of academic research.

My comments on some of the Sub-Committee's questions are as follows:

(a)(d) Medical research in the United Kingdom is mainly done by two groups—the Universities (plus similar centres such as the NIMR, the CRC and the ICRF) and the pharmaceutical industry. A fairly small amount is done outside the Universities, by workers in the NHS or in general practice.

With this framework, pharmaceutical research is largely driven by market forces. The highly successful drugs have been those like cimetidine, which is not only very effective but which has a very wide market. Drugs for uncommon conditions are not usually intensively researched. It is hard to see how outside influence could be brought to bear on this sector short of massive subsidies.

[1]Providing the District Library Service. The King's Fund. 1985.

In academic circles, the situation is much more complex. What research gets done depends above all else today on what specific funding is available (non-specific UGC funding for research has largely dried up, at least in my own Institution), and this in turn depends upon the views of grant-vetting committees such as the MRC's boards. The other main influence consists in some areas being less fashionable than others; the MRC, for example, continuously deplores the low quality of submissions for health care research projects, but this is largely related to the feeling of many research workers that reputations are not to be made in this area. "Soft" disciplines like health promotion are likely to suffer in this way by being considered not fully "scientific".

With the increased reliance on non-governmental funding, a further source of distortion is appearing. It is not too difficult to get funding from well-supported charities in fields like cancer and multiple sclerosis. Unpopular fields such as schizophrenia or sexually transmitted diseases have far less money available for distribution.

It is impossible to say how achieved priorities meet the needs of the NHS without specifying what these needs are. Insofar as they involve improving the delivery of known health-care methods, especially to disadvantaged groups, I would say that the match was not good. The same is true if the need is to maintain standards in the face of shrinking budgets.

(c) Priorities change very slowly with incidence of disease and population structure, rapidly with the introduction of new technology. This militates against the development of "low-tech" solutions to medical problems.

(f) I don't find a lot of duplication. To some extent, the funding agencies see to this. Currently, AIDS research is a worry, since the workers concerned appear to be unusually unwilling to collaborate with each other.

(g) Only up to a point. One major and growing problem is the steeply mounting costs of new treatments and investigations, for example new drug therapies for fairly common diseases like coronary heart disease and leukaemia.

(h) There is a need for more serious training in research methods for the minority of doctors who are going to devote a large part of their time to research. Much clinical research is pretty amateurish, being something of a spare-time activity by people whose main interests may be elsewhere. At present the medical post-graduate training programme makes little allowance for this.

(i) The weakest area of medical research is that concerned with health maintenance and the delivery of health care. This must involve disciplines such as economics and sociology. It is not particularly popular with medical people for several reasons—it is undertaken by people who are not medically qualified; its scientific credentials are suspect; its findings may be regarded as threats to "clinical freedom". It is symptomatic that some of the leading groups (for example health economics at York) are at Universities with no medical school. An effort is needed to bring the two sides much closer together.

With reference to the Select Committee's report on civil R&D, a comment is necessary on the customer/contractor principle. This has been something of a charade where DHSS is concerned. When I worked for the MRC, I found that some of my work in progress had been labelled as "commissioned" without my knowledge, so that the MRC could appear to be acting as contractor to the DHSS. The fact is that in the medical area, where so much of the research is done as it were in the field, the potential contractors often know far better than the Departmental customers just what applied research efforts are most needed at any given time. One University group known to me spends much of its time and resources in first formulating projects and then persuading customers within DHSS to "commission" them. It should be stressed that the NHS, which should be in some respects the principal customer, is distinct from the DHSS and sponsors very little in the way of research. With the changes in management structure in the NHS, it is very desirable to get more scientific input at national level.

In summary, I feel that the needs of the NHS are quite well served by current priorities as far as basic medical science is concerned, at least with respect to the balance between different fields. What is much less satisfactory is strategic and applied research studies of the practical problems of bringing scientific discoveries into use.

April 1987

Letter from Mr Roger Hill

I have recently learnt, a little late for your due date, of your committee.

May I take this opportunity to draw your attention to a proposal which has been under discussion with the University of Exeter for some two years and on which a decision is expected at the meeting of Senate on May 27 1987.

The proposal is to establish a Centre for Complementary Health Studies at the University, which will include in its field disciplines such as acupuncture, chiropractic, herbalism, homeopathy and osteopathy. It will have three primary objectives:

(a) multidisciplinary research, involving many departments at the university

(b) providing a resource centre in association with the Research Council for Complementary Medicine

(c) offering teaching programmes both for health-care professionals and for adult education in conjunction with the university's Department of Continuing and Adult Education.

As far as is known this will be the first such department devoted entirely to complementary health studies in any university in the western world, yet difficult studies have shown that approximately 9 per cent of all primary health consultations are now with a complementary therapist in the United Kingdom.

Please do not hesitate to call upon me if I can help further.

May 1987

Letter from Professor S R Hirsch, Department of Psychiatry, Charing Cross and Westminster Medical School

I have seen Professor Priest's letter to you of 23 June and would like to express my wholehearted support for the points he has raised.

At the moment we are in a situation where only research into established concepts using established methods gets support. Small departments such as he has described do not have the infrastructure to allow them to do the kind of exploratory basic work necessary to make innovations. Those interested in research should take steps to ensure that established departments within universities have such infrastructure and not funnel all the support for research into peer evaluated *ad hoc* grant-supported projects.

However, the situation is made all that more ridiculous by the fact that the money available for even such grant aided projects is decreasing rather than increasing, despite the fact that this is the criteria in which university departments are increasingly going to be judged.

July 1987

Memorandum by Mr S J Holder, Director of Nurse Education, St Mary's Hospital

PRIORITIES IN MEDICAL RESEARCH

The following comments are submitted outside the time limit of 1 October as the letter via the Committee of Vice Chancellors and Principals and St. Mary's Medical School was not received until after that date. The request seemed to have coincided with vacation dates. It is hoped, nevertheless, that it may be possible for the comments to be incorporated into the Select Committee's deliberations:

NURSING RESEARCH AND NURSING EDUCATION RESEARCH

In addressing the question within the remit of the Sub-Committee of "addressing priorities. . . . with particular reference to the needs of the NHS", it is acknowledged that over the last 20 years there has been an increase in research into nursing compared with previous years. Areas covered have been largely in the field of management, manpower and in selected perspectives of education, for example Reid: Northern Ireland; Gott: Newcastle; Fretwell: Royal College of Nursing. Some work has been possible in areas of clinical care such as in the field of communications, particularly from the Nursing Studies Units at London University (King's College, Chelsea) and at Edinburgh University, in the management of the elderly at Manchester and into Prevention of Pressure Sores at Northwick Park. Some small project work has been carried out into the application of "models" of nursing care following the American Experience.

Some Health Authorities, such as Paddington & North Kensington, have established a Nursing Research Unit which is able to respond to local initiatives albeit rather small scale.

THE NEED

Of all occupations within the Health Care sector, nursing provides the greatest area of continuity of care, coordinates and interprets the work of therapists and medical staff and provides the interface between the patients/client; his family and friends and the Health Care System. Research into nursing and nursing education will therefore influence these aspects of the delivery of health care. Furthermore, decisions taken

by nurses in resolving problems arising out of the use of the National Health Services, and in accommodating and facilitating either shortcomings or developments with health care inevitably determine the success and otherwise of such activities.

Particular areas of identified need are:

Community Nursing in all its aspects and specialisms. Staff mix and grade mix in acute settings of care.

The role of primary care (WHO 2,000) nursing.

Appropriate philosophies of care—definition and utilisation for different client groups.

Clinical therapeutic role of nursing

Effectiveness of nursing in follow-through programmes in preventing re-admission to hospital care.

Strategies of education appropriate for a practice-based profession.

Adult learning processes and their incorporation into traditional learning settings.

Stress in nursing and among nursing students.

Retention and wastage of nurses.

Ergonomics of nursing activity in preventing strain and disability.

Health needs of nurses; sickness and absenteeism; drug and alcohol abuse.

Learning and application of interactive skills.

Giving advice and support to clients and patients—appropriate use of information processing systems.

Health educational role of nurses.

Nursing in a multicultural society: health beliefs and responses to health care services.

THE RESOURCES

1. Currently the NHSTA and the DHSS fund a small amount of students undertaking courses with a research component. Nurses can apply for Regional Research Funds. Most work is done in and with the cooperation of University Studies Department.

There is little scope for developing research through funding from Industry: with a few exceptions most research funds from industry are channelled into medical research. The same can be said of the major research foundations which tend to identify more readily for example a recent proposal to the Hamlyn Trust for a Chair into Research into the Nursing Care of the Elderly at Home, which competed with the submission for a Chair in geriatric medicine and was not preferred. Furthermore, nursing has a relatively small base from which to make such in-roads into funding arrangements.

It is essential that encouragement be given to the development of nursing and nursing education research if the major health resource is to achieve its potential. Attitudes need to be changed, including the attitude of some research committees as to the appropriate methodologies for the conduct of nursing research. Without a determined effort in developing nursing research the opportunity for longitudinal studies will be lost and the important area of replication is unlikely to be pursued.

For this reason an initial Government sponsored enterprise is required and it is hoped that the Sub-Committee will respond to the challenge in its report.

October 1987

Letter from Dr Robin Holliday, Division of Genetics, National Institute for Medical Research

I wish to submit evidence to the Sub-Committee under the chairmanship of Lord Nelson of Stafford, which is considering priorities and needs in medical research. This is in response to your letter of 3 March to Mr J Allfrey, Director of the British Foundation for Age Research, a copy of which he forwarded to me. I have been Head of the Genetics Division of the National Institute for Medical Research since 1971. The Division has at present six scientific staff and nine technical staff, supported by the Medical Research Council, and we usually have about ten attached workers supported by grants or fellowships. Visiting scientists have been attracted to work in our laboratories (for one to three years) from the USA, Japan, USSR, Australia, Canada, Switzerland, France, India and Greece. Most of our work is concerned with molecular genetics and is non-clinical, but for many years we have also studied the processes of cell and tissue ageing and it is in this area that I wish to submit evidence to the Sub-Committee.

The Medical Research Council has no specific commitment to the support of ageing research. Instead, it funds appropriate laboratories, wherever it is judged that the quality of research is high. However, this is a very minor part of its budget. Our interest in ageing was initially a by-product of other studies, but

subsequently became an important research programme in its own right. Our results have been communicated to international scientific conferences all over the world and we have published many papers in international journals.

I wish to explain the relevance of ageing research to the wider question of priorities in medical research. It is well known that a considerable proportion of the resources of the National Health Service are devoted to health care of the elderly. Such people are liable to suffer from a wide range of age-related diseases. These include cardiovascular and cerebrovascular disease, cancer, diabetes, kidney failure, defects of sight and hearing, autoimmunity and arthritis, osteoporosis, Alzheimer's disease and dementias, as well as many other less serious ailments. Generally patients are treated for each disease as it arises, although such treatment may well come under the general aegis of geriatric care. It is an unfortunate fact about the ageing process that the alleviation or cure of one condition, is all too often followed by the onset of some other quite different disease. This means that health care is expensive and the benefits achieved in terms of quality and length of life saved may be very limited.

In contrast to support for research on the ageing process, research on age-related diseases is substantial. Support may come from the Medical Research Council, Department of Health or from charitable foundations. The aim of such research is to better understand the origin of each disease in order to prevent early onset, and to devise improved treatments. The underlying assumption of all this work is that each disease has its own specific cause. The results are presented at conferences or published in journals devoted to the particular disease or organ system under study. The clinical or non-clinical scientists involved in this work certainly do not regard themselves as gerontologists, or specialists in ageing research. They would assume that the spectrum of age-related diseases, which comprise the overall ageing process, comes from many causes.

From the biological viewpoint, the strategy underlying this type of biomedical research makes little sense. We know that ageing is a fundamental process which affects all mammalian species and results in deleterious changes in a variety of tissues and organs. Evidence from several sources suggests that the multiple manifestations of ageing may have common underlying causes due to degenerative changes at the molecular and cellular level, although the basic mechanisms are not yet understood. It is, in my opinion, extremely important to devote much more research to the study of these changes. A better understanding of the ageing process *per se* will have very far reaching consequences for health case. It will make it easier to understand the origins of specific age-related diseases, and perhaps therefore to delay their onset. It may well facilitate treatment of these diseases. In addition, it will coordinate the diverse areas of research mentioned above, which are at present carried out under their own labels in specialist laboratories. It could prevent duplication of effort, because independent study of "multiple causes" of age related disease may be superceded by research on one or a few causes.

I must emphasise that the aim of ageing research is not to prolong *maximum* human lifespan, and it is very unlikely that such a result will be achieved. The prevention or alleviation of the many crippling diseases of old age is quite a different long-term goal: it will increase to some extent the expectation of life, but more important, it will improve the quality of life in old age and greatly reduce the cost of health care for the elderly. My argument was summarised in a short article in the *Lancet* (15 December 1984), a copy of which is enclosed.

I do not think I should try to answer in detail the nine specific questions listed in your letter of 3 March. My general feeling is that there is no overall strategy for medical research in this or most other countries. There is no systematic assessment of priorities, rather, support is to a large extent *ad hoc* or based on the lobby principle. A laboratory receives support because it is judged to be doing excellent research; research on a particular disease, such as cancer, is well supported because the public generously donates funds. Ageing research has received very little support because its aims are not understood and it is all too often thought to be irrelevant to serious advances in biomedicine. Until recently, the British Foundation for Age Research received little recognition, although it now has limited funding which allows it to support some specific research projects. Much greater support is badly needed from Government sources.

I would be pleased to provide further information relating to any of the points I have made above.

April 1987

Memorandum from Mr D Horrobin, Efamol Ltd

FUNDING SCIENTIFIC RESEARCH ON PRACTICAL PROBLEMS

The funding of scientific research presents formidable problems to all Governments. Science at its best is capable of providing the richest of benefits. But science is also capable of being extraordinarily costly

and failing to deliver the answers that are sought. No one has yet put into practice a formula which will *guarantee* that at least some of the money that Governments spend on science will be well spent.

But such a formula does exist. Surprisingly, it is not new. It was devised by the British Parliament in what may represent the first ever attempt by a Western Government to stimulate scientific research directed towards the solution of a particular practical problem. In 1714 the inability of sailors accurately to measure longitude while at sea was causing serious losses in both the British merchant fleet and the Royal Navy. The Navy and the City of London petitioned Parliament and asked the Government to find a solution to the problem. If such an event were to occur in 1987—and something nor entirely dissimilar is currently happening with AIDS—the inevitable response would be to set up a committee of experts and to commission a report as to how the problem might be solved. The experts, of course, will inevitably conclude that the problem can be solved only if large amounts of Government money are spent urgently on a massive expansion of the research effort.

Parliament in 1714 was wiser. They decided not to fund research themselves. Instead they established a prize of £20,000, sufficient at that time to make the winner not merely well off but genuinely rich. Practical, specific, precise and easy to understand criteria had to be fulfilled before the prize could be won. The competition caught the imagination of the public and of the scientific community and an amazing flowering of research on longitude resulted. The Government got its answer from a direction which would not have been thought worth considering by any expert committee. The solution lay in the manufacture and use of a chronometer of such accuracy that almost everyone believed that its construction would be impossible. The discoverer was a self-educated Yorkshire clockmaker, the son of a poor carpenter. The Government paid its £20,000, John Harrison became wealthy, and the Navy and the City saved far more than £20,000 in a very short time.

There is no reason why a version of this concept should not be applicable now. Its initiation would ensure an enormous investment in research, none of which would be funded by the Government. The Government would pay only for practical success. And in turn, practical success would very quickly recoup the Government expenditure.

The Government should decide what major problems it wants solving and should ask its economists to work out just how much the absence of a solution costs the country. A prize should then be offered, not for clever research on the problem but only for an unequivocal practical solution. The prize would be set at the estimated value of one year's complete savings, namely the reduction in expenditure due to elimination of the problem, less the cost of implementing the solution.

Most problems requiring solution in this way are likely to be relevant to all developed countries. There is therefore no reason why the European Community, the USA, and other members of the OECD should not get together to increase the value of the prize and of the solution. The beauty of the scheme is that expenditure would be trivial prior to a solution being found. And if a solution were found, the expenditure on the prize would pay for itself within one year. After that, there would be nothing but gain for the governments.

The proposal is in no respects similar to the discredited Rothschild customer/contractor principle of financing research. Under that scheme, customer Government departments sought research on relatively trivial problems, and the contractors sought money simply for doing the research, not for providing practical answers. The initial idea was interesting, but the establishment scientists rapidly took control and corrupted it so that it became little more than a minor variation of existing funding practices. There were no rewards to the contractors for the successful discovery of a practical solution.

Two features are necessary if the scheme is to work. First, the prize must be truly related to the cost, so that major problems will call forth a commensurate effort. Second, the definition of success must be so clear and precise that little expert knowledge would be required to judge success.

There are many problems which on objective analysis are more important, but in view of current concerns, not to say hysteria, AIDS is an example worth looking at. Reliable estimates, based on the numbers of people already known to be infected with the virus, indicate that within five years Europe and North America will be spending about £2,000 million per annum on education and prevention, and £20,000 million per annum on treatment. Government responses have been based on advice by establishment scientists and have been entirely predictable. Committees of experts have been duly appointed. Those experts have been calling for vast increases in research expenditure uncontrolled by any requirement for achievement of practical results. The research performed will be along the lines approved by the experts and will naturally boost enormously the research budgets of the experts' own laboratories.

This approach is unlikely to work. First, Governments seem not to have noticed that there are two types of experts. Some are experts because they really do know how to do things, like building bridges or mending broken bones. Others might more appropriately be called pseudo-experts or "experts", since they clearly do not know how to solve the problem. Their qualification for "expert" status is that they have thought about the problem for a long time, often for decades, and have nevertheless failed to find a

solution. That such people should be called experts is obviously a misuse of language! Why Governments should believe that people who have failed in the past are going to be successful in the future is a mystery.

The second reason for the almost certain failure of the current approach can be understood by those who have the merest acquaintance with the history of science and technology. The answers to difficult problems have almost always come from directions which would not have been predicted by the leading authorities, the failed "experts", of the day. A committee consisting of such "experts" is highly likely to rule out of court the approach to a problem which will finally prove successful.

In the case of AIDS, my alternative proposal is that Western Governments should put no money into AIDS research and should appoint no "expert" committees to advise what research should be done. Instead, Governments should offer a prize of £20,000 million for a cure which would successfully treat 90 per cent of patients with AIDS, if treatment was started within six months of the patient first seeking medical help. The full prize would be provided for a cure which restored patients to health and which also removed the infecting virus from blood and body fluids. Lesser prizes might be provided for treatments which restored health but which failed to eliminate the virus. Such a prize would have an electrifying effect on both the research and financial communities. Winning it would be the equivalent to owning 100 per cent of a company almost twice the size of ICI or Glaxo.

Immediately it would become the ambition of every scientist to find the answer to AIDS and of every financial institution to fund the research which won the prize. Innovative financial structures would be established and money would pour into AIDS research at a rate unlikely to be matched by Western Government funds under the present system. But much more important than the total flow of money would be the absence of control by central committees of pseudo-experts deciding just what research should and should not be done. Thousands of individuals and organisations would get involved, providing a diversity of research approaches which could not be dreamt of under the present system. The answer would be found and would almost certainly come from a direction which would be totally unexpected on the basis of present knowledge. No Government expenditure on the research would be required, and within a year of paying out the prize the solution would be saving Western nations £20,000 million per year or more.

I believe that this concept has a chance of being politically acceptable. Its cost if it failed would be trivial: its rewards if it succeeded would be far greater than the value of the prize offered. There is no reason why the principle should not be applied to any problem to which governments require a solution. Scientists would begin to feel proud of their contributions to national welfare and would have no reason to feel defensive. Governments would begin to feel comfortable with science and would therefore be more willing to devote funds to basic research with no obvious practical value. There would be a substantial transfer of funds to the most practically creative members of society, both in science and in finance. The rewards would go both to the discoverers and to those financial institutions which were most successful in setting up flexible and innovative financial instruments for funding the research.

This is a near-unique situation where the asymmetry between the costs of failure and the rewards of success is dramatic. Failure would cost almost nothing. Success would ensure the most exciting revolution ever in the relationship between Government and science and in the provision of financial support for the scientific effort.

Letter from Professor S L Howell, King's College London, University of London

I understand from your letter of 29 July that the Sub-Committee is interested in receiving further evidence about research in Health Professions, and would wish to contribute some remarks about Physiotherapy.

1. Physiotherapy training in the United Kingdom has, up to the present, been undertaken by means of three-year courses in Physiotherapy Colleges, the courses and qualifications being validated by the Chartered Society for Physiotherapy as the appropriate professional body.

2. It seems likely that the professional role of physiotherapists will continue to evolve in the future, and that physiotherapists will be more involved in the process of diagnosis and in the choice and development of therapy and therapeutic techniques. They will need to approach their work from a more analytical viewpoint, have greater skills in communication, keep pace with technological change and engage in critical review of all aspects of their work. This type of intellectual development seems likely to be most easily stimulated by establishment of undergraduate degree programmes in Physiotherapy.

3. Proposals are now in hand at this college to establish full-time University BSc Courses in Physiotherapy, leading both to an Honours BSc Degree and to a professional qualification. The College is fully committed to this development and is at present seeking approval from the University of London to establish such a course from October 1989, in association with an academic Department of Physiotherapy

with a full complement of staff who would undertake the traditional dual role of teaching and research as University teachers. This would be the first academic Department of Physiotherapy in a United Kingdom University.

4. The new group of Physiotherapy BSc graduates should have an intellectually rigorous training in the Biomedical Sciences, in Statistics and Data Handling and substantial experience of a research project during their undergraduate courses. This will equip them initially to do research at PhD level in Physiotherapy and related topics, and following this to undertake research as well as clinical practice. We see the development of this BSc Course and the establishment of an academic department of Physiotherapy as important first steps in creating an improved research base for the Physiotherapy profession. This should in turn provide the basis for substantial improvements in practice and cost effective treatment into the next century.

I thought your Committee might wish to be aware of these developments.

September 1987

Supplementary memorandum by Professor Howell

THE FUNDING OF DIABETES RESEARCH IN THE UNITED KINGDOM

Little information exists on the extent and origin of funding for diabetes research in the United Kingdom. This short paper sets out to record the current (1985) position, and to set the figures presented in the context of the economic and social costs of the disease.

1. The Impact of Diabetes on Life and Health

The prevalence of diabetes in most adult populations is 2–5 per cent. Insulin-dependent diabetes affects between one in 500 and one in 200 children and adolescents, respectively.

The expected life span in insulin-dependent diabetics is shortened by as much as one-third.

Diabetic kidney disease is present in one diabetic in six and directly causes or contributes to premature death in 50 per cent of youthful onset diabetic patients.

The risk of blindness in advanced societies is up to 10 times that of non-diabetics, and it is the leading cause of blindness in the middle-aged. Visual disability occurs in more than 10 per cent of diabetics surviving for 20 years or more.

Half or more of all non-traumatic amputations are performed on diabetics. About five per cent of diabetics have chronic foot problems, and the annual incidence of gangrene is one per 200 diabetics.

The risk of coronary heart disease is two to three times higher in diabetics than non-diabetics. It is responsible for 30–50 per cent of deaths in diabetics over the age of 40 years in industrialised countries.

(Statistics: WHO Report on Diabetes mellitus, 1985)

2. The Direct Costs of Diabetes to the NHS

No national figures are available for the direct economic costs of diabetes to the health and social services. However a calculation has been made based on a detailed survey of a probably typical area (Harrow, Middlesex) in 1984. This shows that the excess direct costs to the Hospital Service of treatment of diabetes in the United Kingdom was of the order of £279 million in that year. The basis of this calculation is shown in the Appendix.

3. The British Contribution to Diabetes Research

There is an outstanding history of achievement in the United Kingdom of studies on insulin and diabetes. For example in the last few years pioneering work has been achieved in the development of insulin infusion pumps, in the recognition of the importance of islet cell antibodies and the HLA system as markers for the onset of diabetes. The largest series in the world of identical twins in diabetic families has also been assembled and provides an invaluable resource for genetic studies. The United Kingdom also has a very good record in diabetes research by young scientists—of the 20 winners of the annual Minowski Prize of the European Association for the Study of Diabetes, awarded for significant research into diabetes by European scientists under the age of 40, a total of five (more than any other country), including those in 1979, 1982 and 1983, have been awarded to scientists working in the United Kingdom. It clearly has been, and still is, an excellent environment for the conduct of both basic and clinical research in this area.

However, there is a real danger that this expertise and the overall momentum of research may be lost in the present restricted financial climate.

4. The Role of the British Diabetic Association (BDA)

The Association has, through its Medical and Scientific Section, provided a forum for the discussion at its biannual meetings of advances in diabetes research. The meetings are currently attended by 400–600 scientists and clinicians. In addition the Association has for 25 years contributed to the funding of research into the causes and treatment of diabetes; it does not envisage a diminution in the need for such research in the foreseeable future. Indeed, even in the event of a preventive measure being devised tomorrow, the health problems of the existing population with the disease will remain for at least a further 60–70 years in total. Accordingly, the Association has attempted to make provision for the most able young scientists and clinicians to make their careers in research in this area, through the establishment of two to three year Postdoctoral Fellowships and Senior Fellowships (five to ten years tenure), in addition to its long standing support of research through group (five year) and project (three year) grants. The funds available are far less than are required for the full support of all worthwhile projects which are submitted to the Association, and with this in mind the Association has undertaken analysis of the research funding which is available for all forms of diabetes research, from basic molecular biology of insulin secretion and actions through to clinical trials of available treatments for diabetes and its complications. Four major sources are considered, the Medical Research Council, four charities and the Pharmaceutical Industry. Industry also provides funds for both basic and clinical research in areas of particular interest. In addition it undertakes a number of commercially orientated clinical trials of specific drugs which, where identified, have been included in this analysis. The results for the most recent available year (1985) are shown in Table 1.

TABLE 1

Funding of Diabetes Research in the United Kingdom in 1985 (£,000)

	Organisation	*Basic Research*	*Clinical Research*	*Total*
1.	Medical Research Council			
1a)	Research grants in universities etc.	600	200	800
1b)	MRC Units etc.	50	100	150
2.	DHSS	—	100	100
3.	Charities			
3a)	British Diabetic Association	300	550	850
3b)	Wellcome Trust	275	325	600
3c)	JDFI	30	70	100
3d)	Nordisk United Kingdom grant	4	11	15
4.	Pharmaceutical Industry	300	400	700
	TOTAL	1,559	1,756	3,315

Notes:
1. These figures do not include spending by Universities and the NHS on Diabetes Research.
2. Clinical research is defined as research predominantly involving human subjects, other research is defined as basic for the purposes of this survey.
3. Most figures have been rounded to nearest £50,000.

The National Institutes of Health have also provided figures for the total expenditure (intramural and extramural) on research related to diabetes. In fiscal 1985 this amounted to approximately £130 million per annum.

5. Commentary

It will be noted that:

(a) Charitable sources provide 47 per cent of the total research funds, the United Kingdom Government 32 per cent, and the Pharmaceutical Industry 21 per cent. This expenditure is divided approximately 50:50 between basic and clinical research.

(b) The overall expenditure (£3.3 million) on research into diabetes in 1985 amounted to approximately 1.2 per cent of its annual direct costs to the health services, which were at least £279 million. Government (MRC and DHSS) spending is at a very low level (£950,000 of a total MRC budget of £124 million per annum in 1984–85). In particular there is very little "in house" research into diabetes by the MRC in its research establishments and units, amounting to only 0.2 per cent of MRC "in house" expenditure of £74.5 million in 1984–85.

(c) The British Diabetic Association is the largest single contributor of external grants to diabetes research in the United Kingdom, providing 26 per cent of the total funds in 1985. Nevertheless, the BDA cannot hope to meet the needs or aspirations of the research community from the very limited funds available to it. The role of other funding agencies is clearly vitally important.

(d) The very significant advances that have been made in the United Kingdom (see Section 3 above), in relation to the expenditure available, suggest that the United Kingdom provides an extremely

cost effective environment for research into diabetes. There is now real danger that this powerful research base will be irretrievably eroded because of a shortage of funds.

Appendix

COSTS OF TREATMENT OF DIABETES IN HARROW, 1984

Insulin dependent (IDD)	680
Oral agent requiring (OAD)	950
Diet alone	670
Total number of diabetic patients	2,300

1. Cost of Supplies:

IDD: Insulin, syringes, BM stix, sundries	£165 per patient	£112,200
OAD: Drugs, Diastix, sundries	£50 per patient	£47,500
DIET: Diastix	£15 per patient	£10,050
	TOTAL	£169,750

2. Outpatient Costs:

3,200 outpatient attendances at estimated £20 per visit £64,000

3. In-patient costs:

1,200 admissions of diabetic patients occurred in 1984. This is a much higher rate of admission (52.2 per cent) than for the overall District population (17.7 per cent) and the mean period of hospitalisation was longer (nine days versus six days).

The excess in-patient cost of the diabetics in the District at £100 per day was £835,800.

Overall annual cost per diabetic patient in Harrow:

Supplies	£74
Hospital	£391
Total	£465

If these figures are typical for the United Kingdom (600,000 diabetic patients), then the total cost to the hospital service in 1984 was in the order of: £279 million

1985

Memorandum by Imperial Chemicals Industry (ICI)

Priorities in Medical Research

Thank you for asking us to contribute to your enquiry on priorities in Medical Research and their relationship to the needs of the National Health Service. We give below a summarised reply but shall be happy to enlarge on any point or appear in person if you wish.

Our Interest

May we first define our position to establish our credentials and thus define the specific nature of our interest.

Medical Research is driven, and its priorities set, by altruism, inherent scientific challenge, and the need for commercial returns. We are motivated by all three but as a large, successful and international pharmaceutical company, must clearly pay most attention to the last. We are now one of the top 20 pharmaceutical companies in the world with annual sales in 1986 of ca £1,000 million, 90 per cent of which are overseas.

We have always been a research based company. Our current pharmaceutical R&D budget is in excess of £150 million with 2,500 research and development staff in the United Kingdom and the US, including a small group in France. We have mostly been preoccupied with seeking either entirely novel types of therapy or with making substantial improvements to existing treatments. Our track record in therapeutic innovation is significant and is the main cause of our commercial success. Our pioneering work, especially

in such fields as parasitology, anaesthesia, cancer, hyperlipidaemia and in cardiovascular disease, is held in high regard in the international medical profession.

Other Enquiries

The subject of Medical Research priority is one of continual study, enquiry and report. The pace of this activity has been quickened by the massive recent progress in the underpinning sciences and, especially in the United Kingdom, by the need to make best use of collective national resources during periods of academic re-organisation and relative penury and of course by the perpetual debate on drug costs.

You will of course be aware of many published studies of this sort but may we draw your attention to two in particular. Both are recent and deal extensively and specifically with many of the questions you raise. The first is the NEDO Report—"A New Focus on Pharmaceuticals", and especially its Research Report.[1,2] The other is "A Delphi Study of Future Advances in Medical Technology in the UK".[3] We have been substantial contributors to each and have therefore only chosen below to modulate or emphasise particular points.

Industrial Pharmaceutical Research

1. Our business, and consequently our research targeting, is wholly international. Nobody could afford to seek new drugs for the United Kingdom alone which represents but 4 per cent of the world ethical pharmaceutical market. However, this country's needs are inevitably catered for since the main diseases on which we work are of course experienced by North America, Japan and Continental Europe.

2. Due to the substantial and lengthening time it now takes to discover, and especially to evaluate and register a new drug, our research is inevitably directed towards 20 year horizons. We are more concerned with Health Care as it will be then, than as it is now.

3. Research aimed at the discovery of new drugs is competitive, sophisticated, costly and dependent throughout on very high technology. It makes huge demands on national skills and expertise in the basic sciences, especially in chemistry and biology, and in medicine. The United Kingdom is still an attractive place in which to carry out pharmaceutical research due to our traditional competence in these areas and on cost grounds. However, we share the current concern over the state of British Science and have been at some pains to give evidence to your Lordships other Committees dealing with Education for New Technologies[4] and with Support for Civil Science.[5]

4. We are scarcely encouraged in our work by the continual grumbling over drug costs to the NHS. The total amounts to less than 10 per cent of NHS costs and surely represents good value in the use of medication both for the direct relief of human suffering and in reducing the numbers of patients who would otherwise need costly hospitalisation. We might also derive some benefit from greater public recognition of our role as the most conspicuously successful science based export industry in the United Kingdom!

REPLIES TO SPECIFIC QUESTIONS

(a) *Research Priorities*

Priorities in our research stem from our own assessment of market needs coupled with our own views of the timeliness and promise of the underpinning science. The whole process from testing a laboratory idea through to selling a proven drug world-wide is a huge costly job requiring high specialist competence. To succeed we have to be highly selective and have at the moment winnowed our target list down to six areas—Cardiovascular, Central Nervous, Infective and Pulmonary Disorders, Cancer, Arthritis and Pain Relief. These targets obviously cover many therapeutic needs of the National Health Service. It would clearly be of mutual advantage to each of us if we could discuss together any informed views your Committee is able to derive on the particular needs of the NHS.

(b) *Research Balance*

We can only argue for the balance of our own research programme which follows detailed study. When we are larger and more prosperous we shall be in a position to consider a wider ranging research programme. However, seen in a broader context, the balance of medical research depends on so many unrelated factors, not least on individual innovatory responses to changes, either in basic science or the incidence of disease. As such, opinions will differ and the balance will never be seen as "right".

[1] A New Focus on Pharmaceuticals. Pharmaceuticals EDC, NEDO, HMSO 1986.
[2] Pharmaceuticals EDC. Focus on R&D, HMSO 1986.
[3] Future Advances in Medical Technology—A Delphi Study. J Spiby, Lewisham and North Southwark Health Authority.
[4] House of Lords Select Committee on Science & Technology. Education and Training for New Technologies (2nd Report 1984–85).
[5] Ibid—Sub Committee I, Civil R&D (1st Report 1986–87).

(c) *Research Response to Change*

Even a brief glance at a contemporary pharmacopoeia shows that pharmaceutical companies have responded impressively to changes in disease incidence, population structure and new technology. It should be equally obvious that the pharmaceutical industry's own application of new science has itself been one of the main factors in changing both the incidence of disease and the structure of society.

(d) *Research Priority and Funding Balance*

All industrial work aimed at the translation of scientific research into commercial benefit can only flourish if there is a thriving science base. Although the pharmaceutical industry probably spends a larger proportion of its money on its own research than any other sector of industry, it is totally dependent on the background work supported by national funding agencies (for example, in the United Kingdom the Research Councils), and of course the numerous charities peculiar to medical research. For example, the fundamental work on Molecular Biology supported for long years by the MRC is a distinguished massive fundamental study which could not and should not have been industry-based, yet it is one of the cornerstones on which commercial therapeutic biotechnology will be built.

It should also be emphasised that new drug therapy depends for its origins on the fundamental study of disease in the clinic; an area quite properly funded from public and charitable sources, at least until the stage where exploratory drug therapy can be contemplated. When that stage arises we in the industry are of course wholly reliant on the ability of specialist clinicians to work with us in carrying out clinical trials at all stages of drug development. The United Kingdom has a high international reputation for clinical pharmacology but those doing the work in hospitals are funded mostly as clinicians rather than researchers. Inevitably this area is suffering due to current NHS pressures.

(e) *Research Publication*

In view of the lively state of medical research and the countless journals, societies and meetings devoted to it, nobody should really question whether research results are adequately disseminated. The pharmaceutical industry surely stands apart from most others regarding its contribution to the scientific literature.

(f) *Research Duplication*

Any fast moving and populous research area invariably involves parallel studies some of which are seen in retrospect to have been wastefully replicate. But this is no more true of either basic or industrial research in medicine than in any other lively field. Where does healthy competition end and unnecessary duplication start? The best modern therapies are often the result of a palimpsest of successive competitive researchers by separate groups. Parallel but slightly differing approaches by competing groups to the modulation of say histamine, 5-hydroxytryptamine and adrenalin activity have led to a broad and potent therapeutic armoury which could never have come from a single group.

(g) *Research and Patient Care or Health Education*

We can only observe that our commercial success depends simply and entirely on the fact that the drugs we have discovered do what we claim for them and that those who prescribe them are aware of our claims. While we hold this to be true, and shall be compelled to maintain its truth in those areas of medicine where our research is concentrated, we shall be interested to learn what others tell you over the whole range of patient care and health education.

For example, we see the balance between therapy and prophylaxis moving in future years with greater attention to prevention as against cure. We see the diagnostic process becoming more precise, sophisticated and economic. We have been sufficiently impressed by the amount of science and technology which can be harnessed to medical diagnosis that we have recently started our own Diagnostic Research Group. If research in this area is to be reflected in better patient care then we must argue for greater attention to this field by those who fund and prioritise clinical research. We must also ask that if patients in this country are to receive the full benefits of modern diagnostic techniques then the financing of diagnosis within the NHS needs to be properly addressed.

(h) *Research Training*

Medicine must surely be unique in the advantageous close links it can proffer between researchers and users. In the best Medical Schools those who treat patients are closely linked with those who carry out research—sometimes they are the same people. We shall be interested to learn what those now in United Kingdom Medical Schools tell you.

From our standpoint we must re-emphasise our dependence on clinical pharmacology as a rate-limiting step in new drug development. We would also ask for increasing emphasis on this topic in the training curriculum of those who intend to practice medicine if the full but increasingly subtle benefits of modern drugs are to be received by patients.

Medical research is at the moment so vibrant that new training priorities for researchers, for example, in Molecular Biology, are both self-evident and mostly being pursued. But medicine is not exempt from the crumbling which is happening at the frontier walls between the sciences and the new generation of medical researchers, like those in other fields, must be more broadly aware of science than their predecessors.

(i) *Beneficial Changes*

We can add little to what has been said or written at great length about this already. Our main single concern is the one argued in detail in the NEDO Paper,[1] that is, that the constraints on our industry in this country are relieved so that it can prosper and thus support a larger amount of in-house and collaborative research. That paper also deals with orphan and Third World diseases. Our concern about the funding of basic research was dealt with at some length in our reply to your cognate Committee.[5] However, we cannot argue too strongly for selective prioritised funding of the basic and clinical sciences which underpin our industry. As areas for collaborative research they have the unique attraction of combining inherent intellectual interest while supporting one of the few science-based export industries in which the United Kingdom is amongst the world leaders.

B W Langley

April 1987

Memorandum by the Institute of Biology

The Institute of Biology numbers amongst its 16,000 members many who are medically qualified or who are otherwise engaged in research in or bearing upon medical subjects. In preparing this document the views have been sought of appropriate senior workers in the health and education services, in research institutions and in industry. Some 40 written responses have been considered and this submission is made with the authority of the Council of the Institute.

In medical research the Institute sees no clear divisions between fundamental biological investigations which—although of no immediate direct significance—will provide the necessary basis for future applications, studies of the natural history of disease and disability and, at the other end of the spectrum, developments that contribute directly to the practice of medicine and the associated caring professions. All are important to human well-being and an obvious example is the need fully to understand the changes associated with ageing in order one day to control them, while as a matter of urgency improving the care presently offered.

While the overall aim of medical research must be prevention, long-term investment in this ultimate goal must neither restrict nor be restricted by attention to the relief of suffering and anxiety. The intention must be to afford the individual that quality of life that he may reasonably expect to enjoy.

Evidence is submitted under the nine heads proposed by the Sub-Committee.

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

To say that priorities are to a large extent dictated by the major funding bodies, while true, would be an over-simplification. While incorporating a valuable measure of peer review they in turn are subject to pressures varying from professional dedication to public concern.

This has resulted in a fruitful programme of research but one in which immediacy has perhaps played too large a part. Scientific and public interest have proved valuable in focusing attention, but have left other areas unilluminated. Something more is needed to ensure an appropriate blend of the pursuit of matters perceived as urgent or promising and those calling for steady investigation over a longer period. Many of the needs of the National Health Service and of the nation are well served by medical research, but these needs are frequently recognised only when they have become pressing. There are less acute but important health issues—care of the aged, degenerative disease, deafness, mental health, congenital mental and genetic disorders, arthritis—which receive inadequate attention with consequent individual suffering and an increasing national cost. The successes of the present system of setting priorities are numerous and justly acclaimed: its failures have to be assumed from the problems that remain.

The Institute believes that there is a need for central review and coordination, not to stifle initiative in favoured lines of research but to ensure comprehensive cover. Major priorities would continue to be set

[1] A New Focus on Pharmaceuticals. Pharmaceuticals EDC, NEDO, HMSO 1986
[5] Ibid—Sub Committee I, Civil R&D 1985. Unpublished. Our Evidence is enclosed.

by the existing process but attention would be given to the areas in between so that basic but superficially less attractive studies are not neglected. Selection of non-priority areas needs to be as conscious and as careful as selection of the priorities themselves. It is difficult to see that central coordination could be provided without governmental commitment. The Medical Research Council has a good record of recognising the importance of biological research not immediately linked to health, identifying areas where knowledge is meagre and applications not readily apparent. Its policy has produced results of major scientific magnitude and great potential. However, there are signs that it will be directed increasingly to "strategic" research with evidence expected of the likely value in preventive or curative medicine. If this trend continues there will be a serious deficiency of foundation work for tomorrow's applications. Unless the MRC is not allowed but positively encouraged to resume its imaginative attitude to research, some other body will need to be established to guarantee fundamental biological studies.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

The Institute is not competent to distinguish for funding purposes between current areas of applied medical research: its experience lies in more basic studies. Although levels of research—fundamental, strategic, applied, developmental—are concepts rather than categories, lines of investigation do not always flow through them as readily as they should. As they evolve and require different expertise, ideas must move between pure and applied research workers and institutions. It is recognised that this poses difficulties in allocation of credit and reward. Feedback of information and two-way collaboration among the scientists involved—directly and not through administration—must be assured to foster trust and cooperation. This would apply between Ministries, Research Councils and other governmental agencies, and between them, commerce and industry. The unit for industrial collaboration recently established at the National Institute for Medical Research is a pointer. Responsibility for ensuring collaboration could well rest with the central policy and funding body suggested in section (a) above.

It would be ominous if the national answer to this second group of questions was that resources should be concentrated on problems seen as of immediate concern and hang the future. The United Kingdom is not so poor as to enforce so shortsighted a policy.

(c) *Are priorities in medical research adapting to changing incidences of diseases, changing population structures and new technology?*

The danger is that unbalanced pressure for change of priority can be exerted by public demand, which may not always be best advised. While public enthusiasm for a cure should not be dashed, long-term attention to basic studies and intractable problems must be assured (see section (a) above). Relatively little is done to exploit the great potential of comparative studies between man and other species. This potential has been highlighted by realisation of the relations to AIDS of some animal viruses. NHS statistics should be used more to identify conditions which fill hospital beds and clinics, and which therefore promise good returns in individual happiness and health service savings.

The evolution of medicine into subdisciplines may sometimes hamper, for instance, recognition of a multifactorial causation that spans specialities. The medical research establishment has not always been quick to recognise the need for change in such circumstances, particularly where non-medical, even non-scientific, specialisations are involved. An example may be problems imposed by long unemployment and other forms of stress, where remedies to apparently medical conditions may prove to be in part social and perhaps educational in nature.

Not enough is done to predict and manage the social implications of medical change, for example the increasing emphasis on community care for both the physically and the mentally ill. The pressure of immediacy can lead to change of policy before objective mapping has been adequately attempted. Screening and surveys, unexciting in themselves, can speed achievement.

On the other hand there is sometimes need for early commitment. The United Kingdom record is not always good here, either in community medicine or in new technologies, which have too often been left undeveloped. Collaboration with other countries is to be encouraged, but not the loss of research initiative and of commercial rights. It would help were the NHS in a position to direct more technological development.

With respect to our ability to meet changing requirements the inadequacy of the national response to AIDS offers two lessons. One is that, despite the growing appreciation of the importance of viral disease, we have not kept up with other countries (notably France) in basic microbiological studies or the development of laboratory back-up, so that these were not to hand when needed. The days are gone when, with the USA, the United Kingdom was world leader in applied virology. The other is that where we are weak we should be ready to seek international collaboration or, where we have little to offer in return, to pay for it.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

These questions have been treated above ((a)) and the need for international as well as national coordination has been stressed. The Institute would again emphasise the need to review the funding of research on conditions with long-term sequelae such as mental and physical handicap, disablement or degeneration. Much of this will not be appropriate to industry while charitable funding may be restricted where a condition is too ill-defined to command public enthusiasm. To some extent commercial and charitable funding are bonuses in areas where promised returns attract investors and donors respectively. Public funding must be prepared to redress the balance by investment in less "popular" topics and in fundamental studies.

While this enquiry is directed primarily to the needs of the nation, international obligations must not be overlooked and there is one which well illustrates lack of communication and balance. Priorities identified by United Nations agencies for work on the major parasitic diseases of man and other animals in the tropics—malaria, schistosomiasis, trypanosomiasis—have not been taken up. In the United Kingdom that is at least in part due to lack of coordination between universities and industry. Apart from basic humanity and the care of its own citizens when abroad, the United Kingdom could stand to reap rewards in international standing, in knowledge of specific diseases and general epidemiology, and in financial return to the pharmaceutical industry.

(e) *Are the results of research adequately disseminated?*

In the sense of traditional publication in scientific journals results are well disseminated. However, the declining support for university libraries will restrict specialists' reading to journals of predictably relevant output and so lessen the chances of cross-fertilisation. This is to increase an old difficulty as there is always danger of discontinuity between research findings and useful application, and some of today's medical problems call not so much for new discovery as for enterprise in the application of existing knowledge. This may call for dissemination of research results through channels additional to the established scientific literature, perhaps by workshops or other sharply-focused meetings.

It is presumed that dissemination to the general public is not presently being considered by the Sub-Committee. If it is, there is much to do.

(f) *How is unnecessary duplication of research effort avoided?*

It is largely avoided by the review structure of the major funding bodies. Some duplication is more apparent than real, and overmuch concentration on avoidance could restrict fruitful variation. The overall coordination of national and to a lesser extent international medical research urged above would have the effect of directing attention away from areas already well served in favour of neglected topics, and would thereby tend to avoid duplication. A broad and developing platform of publicly-funded basic studies should result upon which charities, industry and other more applied interests could build as priorities become obvious. The current confused interest in nutrition exemplifies the converse, where the lack of a sure foundation of knowledge has permitted insecure and contradictory views to flourish, a form of duplication deleterious to the public weal.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

Not always. The prime example must be tobacco smoking, where the obvious conclusions to be drawn from research have been denied full practical effect by a variety of interests and attitudes, despite the saving in life and in NHS costs that would accrue. There is also a need for perceived and expected health and welfare problems to exert a more direct effect on applied medical research (but not on fundamental studies). This is apparent from changing needs (section (c) above): one example is incapacitating lumbar pain, another is genetic predispositions and diseases, especially those, like Huntingdon's chorea, of late onset.

(h) *What changes in priorities in the training of medical researchers are needed?*

If "medical researchers" is to be read as "clinically-qualified medical researchers", only limited improvements can be envisaged because the clinical training is important and demanding. There has been encouragement for medical students to increase the scientific content of their studies, perhaps obtaining a BSc on the way to medical qualification. This has been educational in the best sense. If the Medical Research Council is not able to provide funding, the DES or DHSS should take responsibility for doing so.

In any case, the Institute would support calls for better collaboration between the DES and DHSS.

Reading "medical researchers" in the fuller sense, there is at present no specific training nor is it obvious how there could be. Medical research draws on such a range of sciences—particularly biological sciences—that at undergraduate level it is not possible to predict with certainty which will be pivotal to future

medical advance. To that extent the future of medical research will depend on the size and quality of the national pool of qualified biological scientists.

Above all what is required is a career structure for non-medical biologists, as the problems are of recruitment, motivation and retention. The reasons for limited contracts are obvious, but even granting them the terms are too short: five or 10 years is more realistic for research productivity. For both clinical and non-clinical workers alike the pressure to compile a marketable curriculum vitae by rapid publication of brief and rather trivial investigations is to the detriment of real scientific and medical advance.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

The main need is for national coordination and international collaboration. Beyond that, and beyond the obvious fact that if prudently managed more resources will provide more results, there are a few worthwhile improvements that could be made at little cost. One is the provision of "seed" money for pilot projects—a desirable preliminary to the mounting of a case for a full-scale investigation. Such monies were once found by universities themselves but are now very much limited by restrictions in funding. The rapid provision of sums of the order of £500–£1,500 could provide informed and positive assessments of possibilities. Another is the funding of "small" science in general: major projects and centres of excellence are not the only worthwhile investments. Together, these modest proposals could help to restore something of the spirit of adventure that is dwindling in our university departments.

In applied research, too little is spent on the more numerous but relatively trivial diseases in favour of the rare and exciting. Apart from the examples of intractable but generally not fatal conditions given above, about 10 per cent general practitioner load is skin diseases—an expenditure hardly reflected in the distribution of funds.

One would hope that the returns on research into new methods of combating the effects of disease and disability are too obvious to require further emphasis. The Institute would therefore conclude its evidence with the words of an industrial member. "We are anxious that enough fundamental research is performed in this country so that we have a sound basis on which to construct hypotheses leading to better therapy."

April 1987

Memorandum by the Institute of Cancer Research

We are asked for comments under nine headings as follows:

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

The priorities are set in part by the existing pattern of medical research which has evolved over many years in response to the recognition of specific categories of disease. In recent years, major technological advances in research and the application of more stringent criteria for awarding research grants has helped to change traditional attitudes and areas of research. Nonetheless, long-term commitment to and continuity in research on important diseases and disease prevention is essential if steady progress is to be made. In cancer research the basic work that has little immediacy of application tends not to reflect either the NHS or national needs except in the general sense that cancer is a major health problem in all developed countries and in many poorer ones too. It is driven by the current ideas on the nature of cancer and by what is technically possible to investigate. This type of research will have a great impact on the needs of the NHS in 10 to 20 years time. There is, however, a considerable body of work which has greater immediacy of application and this often mirrors closely the patterns of treatment of cancer in the NHS and the occurrence of the disease in the community as a whole.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? What priorities change in the light of increased resources?*

It is important to maintain a balance between basic and applied work in that it is from the former that the great majority of technological advances derive and upon which the intellectual framework for Science is based. Overall the balance between basic and applied could be about 50:50. It is difficult to say whether this is presently the case over the whole range of medical research. It would be extremely short sighted in times of financial stringency to cut back on basic research. By analogy it would be akin to stopping mining at the coal face because there were sufficient reserves on the surface. Clearly such a strategy has only very short term validity. At present the programmes which need to be given higher priority in cancer research are those aiming at a greater understanding of the genetic basis of the disorder. In time the precise determination of the genetic material which is responsible for malignant conditions and the

discovery of the relevant gene products will lead to more precise and effective ways of treating cancer. In addition, research into ways and means of preventing cancer, particularly of the lung, whilst more in the field of sociology than pathology, should be encouraged. Were more resources to become available for cancer research it would be appropriate to encourage more scientists to help in the definition of problems with immediate clinical application. Far too often clinicians are too busy and ill equipped to explore soluble problems which abound in their day to day practice.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

In the main, yes but with variable tempo and probably rather faster in response to technological change. The adoption by many branches of medical research of the recent techniques of recombinant DNA in order to define the molecular basis of a wide variety of diseases illustrates well the speed with which the research fraternity can respond if the advances involved are sufficiently clear cut.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

The priorities are very much influenced through the Institutions by which the research is funded. Particularly in recent years the uncertainty of Government funding combined with the relative buoyancy of charitable sources has affected the pattern of research. This in itself need be no bad thing provided that the scrutiny of the research projects remains searching and well balanced. In general commercial funding sources are often of little use except in the penultimate stages of development of well defined inventions which are likely to lead to substantial profit in the near future. Funding for basic science is virtually unknown from commercial sources. There are a few Trusts such as the Wellcome Trust which are difficult to fault or to characterise as either public, charity, or commercial. Organisations such as these which have been rendered by the terms of their foundation independent of profitable return serve an extemely useful function.

(e) *Are the results of research adequately disseminated?*

The scientific literature itself is adequate if not excessive but there is relatively little filtering of information into more publicly available journals. The reporting of science in newspapers for example falls far behind the level at which it is undertaken in many other countries of the world—for example United States of America and Canada. Journals such as *New Scientist* and to a lesser extent *Nature* serve a useful function but tend to be read again only by members of the scientific fraternity. It is important that the principle discoveries of science and the mode of thinking of scientists should become part of our culture to the same extent as the main works of art and literature. Considerable effort will, however, be required to achieve this aim.

(f) *How is unnecessary duplication of research effort avoided?*

Duplication of effort is avoided in part by the system of review of papers prior to their publication in scientific journals. This always involves some assessment of originality by the reviewers. In addition there is very widespread communication between scientists by discussion at meetings, teaching seminars, and international workshops and conferences. Important research findings, provided they are not kept confidential by commercial links, are disseminated rapidly. There is inevitably an element of duplication of effort which is very healthy in that there are few things in bio-medical science which do not benefit from combined approach, and from careful and detailed confirmation.

(g) *Is research reflected as it should be in patient care or health education? If not, why not?*

This is a loaded question which cannot easily be answered. Research ideas may be stimulated in the laboratory and taken to the bedside, or a project may arise from health needs and be taken to the laboratory. Both are useful starting points. The establishment of a number of posts specifically designed to ensure the quicker translation of research findings into practical application would be worthwhile. In many universities and research institutes these days the recognition of commercial liaison postings serves this function but more in relation to commercial advantage than the public good, patient care or disease prevention.

(h) *What changes in priorities in the training of medical researchers are needed?*

In this country the majority of long term medical research workers are not medically trained. They are relatively poorly paid, and we are losing far too high a proportion of our most talented medical scientists to other Western countries. The career structure for doctors is not good for those wishing to undertake research than clinical pratice. This state of affairs is very different from that which prevails in, for example, most of the EEC countries other than Great Britain. It would be most advantageous to have a greater number of clinically trained personnel in medical research and this could only be done if the career structures in research and clinic were comparable.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

There seems little doubt that the biggest single deficiency in medical research at the moment is of able recruits. The career prospects of the medical research worker are dismal and few of our brightest youngsters see any virtue in undertaking a lifetime of excruciatingly hard work for a return which is often considerably less than that available to a skilled labourer. In addition, the lack of long-term posts and contraction of University and Medical Research Council resources has severely damaged the morale of the British medical research community. At the moment there are few good quality recruits available, most of them it seems going into various highly paid posts in the service industries. The problem is particularly acute in London owing to the high cost of living. Anything that could be done to improve this situation would be desirable.

Letter from the Institute of Hospital Engineering

Thank you for your letter dated 3 March addressed to Mr Furness who I relieved in December 1985, which invited the institute to forward evidence to the Sub-Committee chaired by Lord Nelson of Stafford and charged with considering priorities in Medical Research.

This Institute does not fund or carry out research itself, but is the professional body concerned with Hospital Engineering in its widest aspects. As part of our activities we organise between four and six one-day seminars each year on an extremely wide range of subjects relating to Hospital Engineering and the management of the Health Care Estate. These seminars are designed to inform on developments in all aspects of health-care related to IHospE interests. They attract large multidisciplinary audiences including many non-engineers and we have always been fortunate in attracting speakers at the very forefront of their professions. As a result of this and its other activities the Institute has been able to watch the progress of Research and Development over the years from a ringside seat as it were. A number of well defined features have become clearly discernible to us. As these seem to be of general application and may well be helpful to you they are listed as follows:

1. The NHS Health Care Estate (Land, Buildings and Engineering) is a large asset worth some thousands of millions of pounds. Also it uses up a considerable amount of money each year for maintenance and replacement—of the order of £1,000 million. Clearly there is scope for economy in such a large organisation. Many of the methods for achieving economy must also be of value to the private sector.

2. Any economies made in operation and maintenance of the Estate will directly release more funds for patient care.

3. Better estate planning, design and use will also yield economies in medical/nursing staff time and numbers again with direct benefit to patient care.

4. Such a large and complex business as the NHS Health Care Estate needs only one planned and managed Research and Development programme if it is to be carried out at all effectively. Individual efforts carried out haphazardly all over the country can contribute little and may often be extremely wasteful. It seems unlikely that the very much smaller private health care sector will be able to contribute very much at all.

5. The management of R&D projects of any discipline is a highly individual skill, which is difficult to acquire. It demands expert knowledge of the subject matter and considerable time to devote to the projects. It cannot be carried out as a part-time occupation by someone with little or no professional knowledge of the subject.

6. R&D projects should be placed with research teams or individuals who are best able to carry out the work. The successful selection and briefing of a team requires much time and effort. This self-evident truth rarely seems to be either recognised or acted upon.

7. All research and development including "Open Ended" projects should be designed in stages with well defined intermediate targets or "gates". This can be used to prevent uncontrollable time over-runs occurring.

8. Costs and time targets should always be set at the briefing stage and projects audited not only during the currency of the Research but also after completion when the results are clear and can be measured.

9. Research and Development in Building and Engineering cannot now be left to the private sector. Consulting Engineers and Architects formerly had little incentive to be innovative. Fee competition has effectively removed that and ensured that only safe, well tried and known solutions will be used.

10. The dissemination of results is very haphazard. It may be that various professional bodies could and perhaps should be linked up to play a much more active part. In many ways they are ready made and convenient clearing houses.

We endeavour to keep ourselves informed of the results of research in the Engineering and Building professions. This task, never easy, has been made more difficult by the staff reductions which have been taking place over the years in the NHS and DHSS. It has always been made more difficult to grasp relevant research results from allied professions such as the medical or the microbiological and up to now we have relied on speakers at our seminars. It is quite conceivable that the results of some Engineering R&D would also be of general interest to the other professions.

The outbreak of Legionnaires Disease at Stafford demonstrated the many facets of the problem all too clearly.

I feel sure you will be aware already of many of the above points as they are fairly self-evident even though observed in practice. We feel there is much scope for improvement in the whole situation and would welcome the opportunity to meet and discuss the matter should you so wish.

J A Blain

March 1987

Memorandum by the Institute of Medical Laboratory Sciences

The Institute of Medical Laboratory Sciences has members who are employed in laboratories of the National Health Service, Blood Transfusion Service, Public Health Laboratory Service, Medical Research Council, Ministry of Agriculture, Fisheries and Food, institutes of higher education and the pharmaceutical industry.

The Institute promotes research in medical sciences in several ways. It provides grants to Fellows and Associates to support original research work. Prizes are awarded for papers covering original work in medical laboratory sciences. Members can qualify for Fellowship of this Institute through submission of a thesis. A number of these theses have had a significant bearing on research in their field.

Our comments on the nine specific questions that the Sub-Committee have set are as follows.

(a) (i) It is difficult to identify an overall national policy for priorities in medical research.

(ii) Any priorities that are determined are governed by various considerations. A large majority of research programmes are controlled by personal and long standing interests of senior scientists. These interests may or may not reflect the needs of the NHS.

Any research directed by institutes will be related to the interests of that institute and the enthusiasm of staff in post; the research will not necessarily be related to the needs of the nation.

(b) (i) On the whole it is felt that the present balance between different branches of medical research is not right. Research into subjects lacking public appeal is likely to be underfinanced; however, research requiring the use of the latest technology attracts a disproportionate amount of financial resources.

(ii) Programmes which could result in a clear improvement in quality of life should be given priority and all programmes should be constantly reviewed. It is difficult to determine what should be pruned and what given priority.

(c) Priorities do appear to be adapting to changing incidences of disease for example AIDS research; however, caution should be exercised against over-reaction.

Medical research has been less responsive to issues which do not have an emotional appeal for example the changing age structure of the population.

New technologies are not always utilised as rapidly as they should be because of lack of funds.

(d) (i) Priorities are influenced by the organisations carrying out research. Directors of institutions ultimately control their institutions' programmes.

(ii) Charitable organisations aim to promote research in their fields of interest; their success depends upon their influence on public opinion. There is not always a strong correlation between public or commercial support of an institution and results which are of direct benefit to the public. Commercial organisations, when awarding funds for research, can have an undesirable influence on national priorities. However, research which is not based on current needs should not be

discouraged since it can be the foundation for work which provides practical benefits in the future.

(e) Results are disseminated through scientific journals, meetings and symposia. The number of scientific journals currently available can lead to information being too widely spread. Information is often published late either because of being withheld for meetings or because of the time taken for an article to be published. Where findings are being patented the situation can be worse as results are kept secret until the patent is granted.

(f) Duplication of research effort is difficult to avoid without universal communication; however, it is not necessarily desirable to avoid repetition of research.

(g) On the whole, results are effectively applied in clinical medicine. However, the time between publication of research results and the government taking action can be indefinite for example the effect of tobacco or alcohol on public health. Direct improvements in patient care and health education should not be the sole motivation since all knowledge is potentially useful.

(h) Medical laboratory scientists provide an important core of research staff. They qualify through the Institute's educational system, receiving formal training in medical laboratory sciences. The Institute of Medical Laboratory Sciences has a commitment to further development of training programmes for those undertaking research. It would be highly desirable to remove the artificial distinction between the different classes of NHS medical laboratory scientists.

(i) There should be changes in organisation and funding of medical research. All progressive establishments should have access to a research and development component. It is sometimes difficult to persuade government departments of the desirability to carry out certain lines of research. Professional organisations should be encouraged to provide substantial financial support for scientific research within their own fields of interest.

Memorandum by the Institute of Physical Sciences in Medicine

Introduction

The Institute of Physical Sciences in Medicine (IPSM) is a charitable body whose objects are "To promote for the public benefit the advancement of physics and allied physical sciences applied to medicine and biology and to advance public education in this field". Its membership comprises Medical Physicists, working in hospitals, universities, Medical Research Council establishments or similiar bodies, who are graduates in such fields as physics, electronic engineering, mathematics, computer science, statistics and mechanical engineering.

The Select Committee will be aware already that Medical Physics Departments are making substantial contributions to research and development in the enhancement of patient care. This evidence summarises some of the areas of work, outlines some of the obstacles to its more rapid progression and responds to the specific questions posed by the Science and Technology Committee.

Summary of Research and Development in Medical Physics Departments

The successful prosecution of research and development by Medical Physics Departments requires an integrated team of multidisciplinary scientists supported by well-qualified technicians. The following summary cannot be comprehensive but is intended only to illustrate the scope of contributions to improving the diagnosis, treatment and care of the patient. All of these facets are encompassed by specialist Topic Groups of the Institute's Scientific Committee.

1. *Radiotherapy Physics*

Cancer affects almost 0.25 million people annually in the United Kingdom. It is the second commonest cause of death. The main curative treatments are surgery and radiotherapy, which involves treatment of the malignant disease with ionising radiation.

Medical Physicists contribute to the understanding of the disease and its treatment by improving both radiation dosimetry and techniques for maximising the dose to the target tissue while minimising the dose to healthy tissue. Recent contributions include refining computerised methods of radiation treatment planning and computerised control of therapy equipment. Current developments include the enhancement of therapeutic irradiation by controlled heating of tumours using ultrasound and microwaves, which also impose requirements of accurate measurement, control and optimisation.

2. *Diagnostic Radiology Physics*

The Medical Physicist has a major role in developing methods of minimising the radiation dose while maximising the diagnostic value of X-ray images. In collaboration with Radiologists, studies are undertaken to exploit image intensifiers with TV displays and also digital radiographic techniques employing powerful

computers to manipulate the images. Similar research is prosecuted to enhance the tissue indentification of computerised tomographic (CT) images.

Medical Physics Departments in the United Kingdom have pioneered the recently established nuclear magnetic resonance (NMR) imaging and are developing other techniques such as electrical impedance imaging.

3. *Radiation Protection Physics*

Medical Physicists have long-established expertise in radiation protection, acting as Radiation Protection Advisers for their Health Authorities. While continuing to contribute to research and development in conventional areas such as shielding design and new instrumentation, the work has now extended into other areas. In the non-ionising radiation field, British Medical Physicists are at the forefront of original work involving ultra-violet radiation, lasers, microwaves and ultrasound. Medical Physics Departments have contributed expertly to environmental and public health aspects of radiation and never more so than in providing reassurance by monitoring members of the public, foodstuffs and environmental samples following the Chernobyl Incident (as described in the IPSM Report 50 "Chernobyl: Response of Medical Physics Departments in the United Kingdom").

4. *Radionuclide Physics*

In order to image body organs and diagnose their function or to examine body metabolism and composition in a variety of diseases, a radioactive form of a body element or a pharmaceutical with radioactive label may be administered to the patient. Applications include identifying secondary cancer deposits or blood clots within the lung, or quantifying blood flow during the cardiac cycle or urinary excretion during kidney function. The Medical Physicist is involved in the development of new radiopharmaceuticals, generating computer software for quantitative dynamic studies and innovative imaging procedures leading to 3-dimensional display of organ function.

5. *Clinical Instrumentation and Physiological Measurement*

The detection and measurement of physiological signals is a vital part of the diagnosis and treatment of many diseases. Research and development in this field is commonly at the forefront in most highly specialised branches of medicine and surgery. Often it is necessary to devise new "transducers", interfaces and sophisticated systems for collection and analysis of the data, sometimes for periods of 24 hours or more, possibly in ambulatory patients. The range of applications is enormous but embraces measuring minute electrical signals in the heart (even plotting in the heart during surgery), the brain and nerves, pressures in the brain, bladder and blood vessels, flow in blood vessels, kidneys, bladder and urinary tract and computer control (frequently exploiting microprocessors) of treatment, such as drug infusion, and monitoring as during open heart surgery and intensive care. Medical Physics Departments generate such instrumentation, evaluate commercial equipment, ensure its reliability and safety and may also supervise the maintenance and servicing of clinical equipment.

6. *Medical Ultrasonics*

This field is an outstanding example of the fruitfulness of collaboration between physical scientists and clinicians to which substantial progress continues to be attributable. The principal applications of medical ultrasonics are in cross-sectional imaging including real-time dynamic examinations, blood flow studies using Doppler techniques and increasingly in examining tissue structure and physiological function.

7. *Computing*

Developing the clinical applications of computing is now an integral part of the Medical Physicist's role. As already indicated, computers can contribute to most medical specialties. In many small hospitals, the developments involve microcomputers and microprocessors for real-time data acquisition and on-line data analysis. In contrast, larger departments having more extensive computing facilities may employ systems software and communications networks and develop programmes for specific medical applications.

8. *Clinical Engineering*

The professional engineering skills of Medical Physics Departments are exploited in developing artificial heart valves, prostheses, powered limbs and specialised surgical tools. Aids for the disabled are devised including calipers, splints, personalised controls for motorised chairs and microprocessors for communication aids.

RESPONSE OF THE INSTITUTE TO THE SPECIFIC QUESTIONS

(a) *Priorities*

The priorities for medical research are largely set by the Research Councils and other major sponsors. There is an urgent need for a total review of the overall system for funding.

Resources available to the Research Councils are totally inadequate. This inadequacy is exacerbated by the establishment of specialist Units by the Research Councils often representing a major "top-slice" of

the available resources for continued funding of Research Council employed staff or facilities within the Units. Similarly, the limited number of Research Studentships are also effectively "top-sliced" to giving first priority to MSc or other courses sponsored by or relying almost entirely on support from the Research Councils.

Although the "centres of excellence" approach has its merits, it can stultify the graduation of other centres to such excellence by deprivation of "pump-priming" resources. (If you cannot afford to enter the competition, you obviously cannot win it!) The system has an in-built potential for inertia and stagnation and, unless reviews are undertaken rigorously and ruthlessly, a substantial part of the priorities for medical research become ossified.

Other major sponsors of research, especially the principal charities are often founded specifically to support research in particular fields. If the funds available to these bodies derive primarily from donation by the public, the resources available for allocation presumably reflect the priorities for medical research conceived by the general public.

However, there is need for an overview nationally of the resources available from central and private funding to provide some balance of priorities across the many possible fields of medical research. For example, if huge resources from charities were being funnelled into a "glamour field" such as "Heart or Cancer Research" a complementary proportion of central funding might be deflected into the less glamorous fields. These could include Geriatric Medicine, Technical Aids for the Handicapped and the essential research and development undertaken in NHS Departments of Medical Physics for the more immediate benefit of patients.

More locally, the shortfall in funding available through the Research Councils and other bodies, is placing an overwhelming burden on the much more limited and inadequate funding allocated within the Health Service budget. There is a very real danger that highly meritorious research will fall between the two stools of not attracting support that would almost certainly have been forthcoming from the Research Councils in more affluent times but is generally unaffordable within the minute resources available to local NHS Research Committees. Priorities are, therefore, distorted.

For the reasons outlined below, the priorities almost certainly do not reflect the needs of the National Health Service though arguably they may reflect more closely the longer term health needs of the nation.

(b) *Balance of research*

The importance of fundamental research to "advance knowledge" is recognised. However, its outcome is unpredictable and usually on a long timescale. Such work is often expensive and carried out in academic laboratories or institutes physically and intellectually remote from the coal-face of diagnosing and treating patients. The long-term goals are usually highly attractive and desirable but frequently prove over-ambitious and, at best, only partially attained. Given the limited resources available for research, it is proper to question whether the substantial proportion allocated to these areas represents a proper balance compared with that devoted to less esoteric research and development providing more immediate benefit to the patient. Even if more rather than less resources were to be devoted to medical research and development, a thorough reassessment of long-term funding especially in the more peripheral fields is necessary to eliminate the suspicion that some Research Council Units and influential academic departments are receiving unnecessarily protracted support.

The present imbalance could be alleviated by making a greater proportion of research funding available for allocation within the Health Service itself. Priorities would then be set by clinical and other departments such as Medical Physics having a direct appreciation of the needs of their patients.

If increased resources became available, the pendulum of priorities could be allowed some well-considered swing back to more esoteric areas of research.

(c) *Adapting priorities to changing circumstances*

Priorities in medical research are capable of adapting rapidly to changing circumstances, as exemplified by research into aspects of AIDS and the response of Medical Physics Departments post-Chernobyl. However, in general the system has an inherent inertia for the reasons presented above. Some diseases, such as those associated with the thyroid, are not necessarily life-threatening but remain fashionable areas for research after many years of investigation. In contrast, research into diseases associated with longevity, such as Alzheimer's disease are only recently becoming the vogue despite the long-established increase in the elderly proportion of the population. New technology undoubtedly makes an impact on the accessible areas of research but major facilities such as those for computerised tomography and presently for magnetic resonance imaging are, certainly initially, available to only the chosen few.

Again, priorities might adapt more quickly if a greater proportion of research resources were available locally. Certainly, Medical Physics Departments have established excellent reputations for the rapid

introduction of new procedures in collaboration with their clinical colleagues. However, these productive developments are more frequently limited by resources than by inventiveness.

(d) *Influence on priorities by funding institutions*

As discussed above, the piper's paymaster significantly influences the tune, whether a Research Council or specialised charitable body. Criticism has already been made of over-emphasis on the "established centre of excellence" principle. Whether justified or not, there is a perception that funding levels are inversely proportional to the distance of an institute from the central offices of the grant giving body (usually in London). A proper analysis would be of interest.

In certain instances, it seems clear that the research interests of some institutions are modified to match those of funding bodies in order to attract funding.

(e) *Dissemination of results*

Sufficient outlets exist for the dissemination of research findings through the journals of relevant learned societies or medical/scientific conferences. For example, the Institute of Physical Sciences in Medicine publishes two journals (Physics in Medicine and Biology; Clinical Physics and Physiological Measurement) and innovatively supplements its conferences by Round Table meetings involving small groups working in newly developing fields.

However, dissemination is less satisfactory than it might be because library budgets are becoming increasingly inadequate, limiting severely the range of subscriptions, and the funding for participation in conferences is analogously restrictive. There is a need to increase the resources available for these purposes.

(f) *Duplication of research*

Some duplication of research effort is essential to provide cross-fertilisation, mutual support (and even competition) and necessary confirmation (or otherwise) of new findings. Unnecessary duplication of research effort can be avoided by reference to the literature, conferences, and a knowledge of related work in other institutions.

(g) *Research and improvements in patient care or health*

As pointed out previously, the more esoteric research is unlikely to yield immediate improvements in patient care or health education. However, its long-term potential is not to be denigrated or underestimated except perhaps in the abstract pursuit of knowledge for its own sake.

The allocation of a greater proportion of research resources within the Health Service for use according to more local priorities would seem undoubtedly beneficial for the care of patients and the general population.

(h) *Training of medical researchers*

Medical researchers usually comprise graduates in medicine, science or engineering whose training perforce require different approaches and priorities.

The curriculum for the medical undergraduate is already overloaded and inevitably protracted. Only few universities offer an intercalating year in which a course, such as that leading to the Bachelor of Medical Science degree, can be undertaken giving a broad exposure to the applications of science and technology in medicine. Unfortunately, most medical graduates lack such an appreciation, until acquired to vastly differing extents during their working experience. Some grants are available for Research Registrars but far too few.

The Institute of Physical Sciences in Medicine has established an outstanding Training Scheme for Basic Grade Physical Scientists, which provides excellent exposure to all specialties within Medical Physics, to relevant aspects of medicine and, by completion of a project, an introduction to the planning and execution of research and development. Further, Medical Physics Departments not only meet the needs for clinical services but it is a waste of expertise and ingenuity if their scientific and technical excellence is not fully exploited in research and development for the benefit of patient care. Consequently, training in medical research for the physical scientist should be routine within his career progression. Nevertheless, there is an urgent need for more Research Studentships/Fellowships to allow the newly qualified physical scientist to prosecute research on a full-time basis not only for his/her benefit but also for the progression of projects. As stated earlier, for a variety of reasons the MRC allocation of Studentships is oversubscribed to the point of suffocation.

(i) *Proposals for specific changes in the organisation or funding of research*

Proposals for specific changes in the organisation or funding of research have been incorporated in this evidence. They can be summarised as follows:

(1) A substantial increase in funding for medical research and development is essential.

(2) The method and rationale in allocating resources by Research Councils should be reviewed.

(3) A national overview of the resources provided centrally and from charitable bodies might optimise the distribution of funding across all fields of research and development.

(4) A much greater proportion of monies available for research should be vested directly in the Health Service to permit local determination of priorities, for example through Health Authority Research Committees.

(5) Health Authorities should be encouraged to exploit the inherent expertise and ingenuity in its own Departments, such as Medical Physics, by providing additional support for research and development.

(6) The importance of purchasing relevant journals and books as well as attending courses and conferences should be acknowledged by improved funding.

(7) The present system for allocating Studentships/Fellowships merits review and consideration should be given to increasing the number available for graduates in science and engineering as well as in medicine.

(8) Training schemes, such as that of the Institute of Physical Sciences in Medicine, and intercalating courses of universities should be encouraged and supported centrally.

June 1987

Memorandum by Professor Bryan Jennett, Department of Neurosurgery, University of Glasgow

This personal submission is based not only on my experience as Dean of the Faculty of Medicine since 1981 but as a member of the Chief Scientist Committee at SHHD and as a former member of the DHSS Panel on Medical Research, of the Neuroscience Board of the MRC and of the Medical Research Council itself; also as an MRC grant holder continuously since 1970. The views of the pre-clinical departments of this Faculty have been incorporated in the submission from the Dean of Science. In the time available for submission through the University I found it impractical to co-ordinate a response from the 40 clinical departments of the Faculty; moreover I wished to include reference to the Stoker report to the MRC and to other very recent exchanges in the journals about the MRC and clinical research.

My concern is to draw the attention of the Select Committee to certain problems that are peculiar to *clinical research*. These derive from the complex relationships not only between the NHS and the UGC but between these two bodies and the MRC, industry, and the medical charities and trusts. As reduced public funding forces the NHS, UGC, MRC to adjust their priorities each is tempted to economise at the expense of the others. Poised astride this three-legged stool of public support clinical research is dangerously unstable. Its future is uncertain because there is no overall coordinating body concerned with its pursuit or support—as I point out in my 1984 Rock Carling monograph on "High Technology Medicine, its benefits and burdens".

In his 1981 Rock Carling monograph "The Universities and the NHS" Fred Dainton asserted, "A health authority which manages university hospitals is the place where the future confronts the present and the problem is to make this confrontation productive rather than cause sterile and destructive tensions". Those tensions have been accentuated since he wrote because financial stringency has threatened the goodwill underlying the "knock-for-knock no cost-accounting" concordat between the two institutions. This promises to be further aggravated by the appointment of general managers in the NHS and by increasing emphasis on clinical budgeting and efficiency in relation to patient care. Another threat to clinical research is that concern about medical manpower is making health authorities increasingly unwilling to grant honorary contracts to research clinicians funded from outwith the NHS. Yet much clinical research can be done only by clinicians and it depends on having staff additional to the number calculated by the NHS as necessary for patient care. The problem is therefore a wider one than that of assuring and coordinating adequate financial support (annexes 1 and 2).

What is medical research? (Figure 1)

The amount of activity and achievement in and of support for various kinds of medical research is difficult to ascertain because definitions differ.

Biomedical research includes *basic science* much of which is carried out by science graduates in research institutes, in the laboratories of industry, and in the science faculties of universities; that done in medical faculties is often in preclinical departments. Considering the amount of research money available for medically related research scientists naturally seek to stress any possible relationship between their work and the practice of medicine. No one doubts the value of basic science for the understanding of human disease but some of this work that is labelled medical is connected only tenuously with medicine.

Clinical science describes that aspect of clinical research that is most directly related to basic science. The application of laboratory techniques in hospital may require scientists working beside clinicians, whilst the solution in basic science laboratories of problems posed by human disease may be facilitated by clinicians who have laboratory experience. Some such work is concerned with monitoring physiological parameters in patients but much of it involves patients only as a source of biological material for laboratory studies. These utilise the abnormal physiology of patients as a means of finding out about basic mechanisms of normal function sometimes about the causation and detection of disease, and occasionally about its treatment. Such research is largely carried out in laboratories of biochemistry, immunology, genetics, molecular and cell biology, and in academic departments of medicine and its subspecialties. This kind of research was probably uppermost in the mind of Lord Rosenheim when he commented in 1968 that a moratorium on clinical research for 20 years and a redirection of effort towards appyling what was already known would result in widespread improvement in health.

Health service research includes the kind of application of what is already known that Rosenheim had called for and that was also the concern of the Rothschild White Paper of 1971. As well as being concerned with the organisation, provision and auditing of health care health service research includes epidemiological studies. These deal with the frequency and distribution of patients with various conditions with a view to identifying causative mechanisms that might lead to preventive measures, as well as providing data as a basis for planning services. Research of these two kinds is carried out by departments of community medicine and departments of social science in universities, as well as in research units funded by the health departments, often in collaboration with university clinical departments.

The area of greatest neglect in clinical research is the *evaluation of practice,* (procedures and technologies) in hospital. With the exception of drug trials there is in the United Kingdom little such activity—which suffers from being at the borders of clinical research and health service research. The US Congress has had an Office of Technology Assessment and an Office for the Medical Applications of Research for many years, and in the last two years programmes of technology assessment have been initiated in Sweden, Holland and Denmark. Little interest has so far been shown in Britain although this kind of research is greatly needed by the NHS, and my Rock Carling monograph emphasising this was well received (Annex 3 [*not printed*]). Yet the presence of the NHS should make it possible for such evaluative research (including the assessment of technology) to be organised more readily in the United Kingdom than elsewhere and with a reasonable prospect that results of practical importance could be systematically applied on a wide scale.

Funding of clinical research (Figure 2)

Charities, industry and independent trusts support much clinical research and maintain both academic posts and whole departments in medical schools. The MRC is now a minor contributor and its plan for clinical professorships has not flourished. Disease-oriented charities spend more each year on research than the total MRC grant-in-aid whilst industry contributes four times as much to clinical research as the MRC spends on its entire operation. What fraction of MRC expenditure can be regarded as truly clinical is difficult to calculate. Certainly claims based on counting all grant support in clinical departments as well as that to basic science laboratories that process patient material give an inflated impression. Probably less than a fifth of the MRC budget is spent on research related to patient care. The contribution of the UGC is likewise difficult to establish other than by aggregating the support of clinical departments in medical schools.

The contribution of the NHS to clinical research through the Chief Scientist organisations and through locally funded research is relatively small. However, the provision of buildings, equipment, staff and consumables in teaching hospitals is a huge and uncalculated resource in clinical research (Annex 4). This year for the first time the UGC medical sub-committee has requested a return showing the accountable contribution of the NHS to clinical departments. However, much of the NHS support is difficult to include on a balance sheet—for the patient care facilities of the teaching hospital are the "laboratories" of the clinician whose research is on the evolution and evaluation of diagnostic and therapeutic procedures.

The future of clinical research

Whilst it may be appropriate for the MRC to be regarded as a leading agency in supporting (and proferring advice on) biomedical research it can no longer claim primacy in clinical research as a whole. Indeed it has become increasingly obvious that the Council is unwilling or unable to become involved in clinical evaluation and technology assessment, let alone in health service research. The Rothschild Report considered that the MRC had favoured basic science at the expense of clinical or applied research. The transfer of 25 per cent of the MRC budget to the health departments in 1972 was to provide an opportunity for the health departments to commission research that was regarded as directly related to problems of immediate significance. In the event the DHSS proved unable to define its research needs in terms that were recognisable by MRC scientists as feasible programmes or projects and eventually the funds were returned to the MRC with the proviso that a specified sum be spent annually on *health service research.* However, the MRC appears to have had difficulty in developing a successful portfolio in this field.

Approaches to the MRC to become involved in a programme of Consensus Development Conferences, similar to those run successfully at NIH by the Office of Medical Applications of Technology since 1977, have been coolly received. In the event such a programme has been initiated by the King's Fund, under my Chairmanship. Similar programmes are now running in Sweden, Holland, Denmark and Norway.

The most recent evidence of the MRC's stance on clinical research comes from the Stoker Report to Council on the future on the Clinical Research Centre and the response to this of the Director (C C Booth) in the *Lancet* of 15 February (Annex 5). These make it plain that for the MRC clinical research is equated with clinical science, and that its concern is with what I have defined as biomedical research. The MRC has been conspicuously successful in basic science and to a lesser extent in clinical science. But the narrowness of its view of clinical research should be recognised. Indeed concern about the attitude of the Council to research related to clinical care was strongly expressed by several correspondents in the British Medical Journal only last month (Annex 6).

The Stoker Report expresses concern at the consequences of the decision to place the CRC in relation to a District hospital and to distance it from University influence. The Director alleges that university clinical departments neglect the study of common diseases, are pre-occupied or obsessed with the rare and the esoteric, and are likely to be increasingly unable to adapt to the challenges facing clinical research in the next 15 years. The *Lancet* made no editorial comment but printed at the end of this article two paragraphs from my December Newsletter—including the comment ". . . the place that is most crucial for the future health of society—the medical school. This is where all the country's doctors are educated, where medical advances are made and evaluated, and where much of the most advanced health care is more available to patients". An editorial in the *British Medical Journal* in February 1985 entitled "Stagnation and Despair in Medical Research" was based on a similar assumption—that clinical research meant clinical *science* (as defined here). I wrote questioning this and suggesting the need for UGC, NHS and MRC collaboration on a more broadly based programme of clinical research (Annex 7).

A strategy for the management of high technology medicine in the future that involves a significant commitment to research in clinical evaluation is included in my monograph (Annex 8). I there propose that none of the existing organisations is well-placed to undertake this overview of clinical research and have proposed a new consortium—not dissimilar to one subsequently proposed by the Institute of Medicine in Washington. My conclusion is that clinical research is too important to leave to the MRC, expecting it to be the main source of advice and of funding. Similarly Health Service Research is too important to leave to the NHS alone. The annual exchange of information between the MRC and the Health Department does not provide an adequate form for discussion. There is need to involve the medical charities and trusts with these other public bodies in a new consortium.

February 1986

Figure 1

CLASSIFICATION AND CONTENT OF MEDICAL RESEARCH

Basic science

Biomedical research

Clinical science

Clinical research

Clinical evaluation

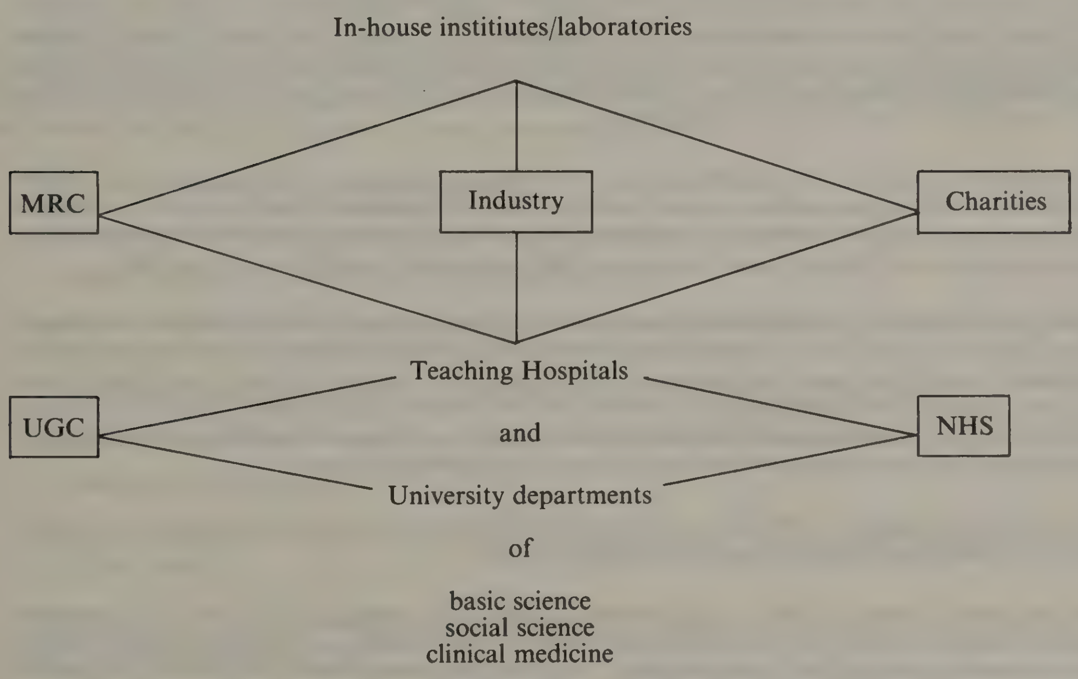
Health service research

Organisation/delivery of health care

Epidemiology

Figure 2

FUNDING AND SITING OF MEDICAL RESEARCH



Letter from M A Launer, Consultant Psychiatrist, Burnley, Pendle and Rossendale Health Authority

With reference to our telephone conversation last night, I thought I would set out for you some of my experiences, with reference to research, over the time that I have been involved with medicine, which dates back to my entrance to medical school, which was 1964.

As a medical student clearly you are attached to a University department and there is always a great deal of encouragement for us to get involved in research. Some of the keener students become actually involved and sometimes are quoted as co-authors of papers, often because they have done the donkey-work for some of the research doctors involved. This always struck me as quite an anomaly as I always felt that, as a medical student I did not have the requisite experience to either be involved, or even be used as a donkey, with reference to research that was in any way meaningful. Clearly, it is used as a stepping-stone for greater things, but this is more indicative of the personality characteristics of the student rather than his ability to achieve any meaningful research in the future.

As a junior doctor, when attached to University departments, I was always encouraged to become involved in research projects and given plenty of support as clearly the clinical workload on the Universities is not as great as on the periphery. Clinical research grants were not as forthcoming; it appeared that the key to getting these was held by only a small number of people and they were not keen to circulate it much further than their own small clique. The exception to this was in the special hospitals, where, although the special hospitals research unit functioned as a clique, the actual superintendents of the special hospitals were keen to encourage me, as a senior registrar, to do research, and even, in fact, gave me a grant to study for a couple of weeks in Cambridge.

The key to doing some useful research is to get some ancillary workers to do the donkey-work. Clearly, at Universities and Colleges there are juniors available, but in the periphery these people are involved in service commitments and are, therefore, only available to a limited extent. In order to get these juniors money is required in the form of research grants and this is clearly not available in the periphery.

The Regional Research Committees are open to the periphery to apply to. Unfortunately, the research form that has to be filled in involves extensive work and the representative for each speciality on the Committees is usually the head of the department at the University. The people whom I have been involved with at the University are extremely keen to make sure that research is done only at the University and any attempt to spread this beyond the confines of the University, or in some cases beyond the confines of people who are very much associated with the University, is resisted at all costs.

This ensures that research is only done at Research Institutes and that any research which is attempted to be done outside these Institutes is quickly nipped in the bud.

The exceptions of course are the various voluntary bodies and pharmaceutical firms. The commercial interests are usually confined only to their own products, or to substances, or inventions closely allied or liable to enhance the sale of their own products. They will fund these projects and, in fact, also provide the statistical and secretarial help without much prompting, and tend to canvass quite actively for this sort of thing. This sort of research is very limited in value and often totally valueless.

I always felt that if research is to be of any value at all it must be totally spontaneous and developed in a totally independent manner by people who want to do research, for its own sake and not for the sake of advancing their careers, or because they are told by other people that it is a good thing to do. All Consultants appointed within the NHS have a clause in their contracts which encourages them to do research. Unfortunately, those who work in peripheral hospitals, although not prohibited from doing research, are not encouraged in any way. They have neither the time, the facilities, or the encouragement to get funds and many eventually give up any thoughts that they had in that direction and channel their energies into private practice and often the funds that they attract, with regards to innovations, etc., can be utilised in research this way, a good example of this is Patrick Steptoe and the test tube babies.

Both Steptoe and John Charnley with his hip replacements have evolved in the North West from peripheral units, but clearly there was a great struggle involved as neither of them were directly involved in the University. It is as if the University has a monopoly stranglehold on research, and that anything that is done outside them is distrusted as being badly organised, which, in fact, it is bound to be because there is nobody to do the various back-up, which converts a loosely ordered paper into a bona fide research paper.

The fault is not with the journals. The journals are short of papers these days and will always accept quality papers. The fault is being able to write a quality paper and have the ancillary workers to help with this task.

As a result of my experiences running an Eating Disorders Unit at Burnley we have now abandoned any hope of writing any research papers on our experiences, or, in fact, doing any meaningful research on our work. It is now run purely as a clinical project, seeing, assessing and treating patients, many from outside the District. Despite being allocated no funds at all from any source I have still managed to present papers to the World Psychiatric Association, in Copenhagen, to The Royal College of Psychiatrists, in London, and also locally to the North West branch of The Royal College of Psychiatrists, all of which were received extremely well by the participants, who were amazed at our ability to run such a unit in a peripheral hospital without University help. This sort of event should in fact be commonplace not unusual, and should be encouraged both locally and nationally. I feel that there should be funds set aside for non-University peripheral units, which could be assessed by peripheral Consultants for their suitability. Only then can we see real breakthroughs and not the sort of stagnant research that comes out of the Universities.

I should add that my attempt to discuss a Regional Research Grant with the professorial representative in my Region was met with a total disinterest, and even a request to come and discuss how I may fill the form in most profitably was turned away with disdain.

April 1987

Letter from the Leukaemia Research Fund

The Leukaemia Research Fund is a national charity, founded in 1960, and is concerned with research (medical, scientific and clinical) into leukaemia, lymphomas and related haematological malignancies. It is the third largest cancer research charity in Britain and the largest organisation of its kind in Europe. It is a member of the United Kingdom Cancer Coordinating Committee.

The Fund's activities, in summary, comprise:

— the financing and establishment of major research centres based on universities

— project grants over a wide range of topics and disciplines

— clinical research and patient care through the establishment of academic posts and clinical fellowships at National Health Service hospitals, currently totalling 25 posts

— academic programmes including international meetings, symposia and workshops

— information services on the respective diseases through the publication of pamphlets

— international collaboration.

The Fund is advised by a Medical and Scientific Advisory Panel, the chairman of which is Professor Sir David Weatherall.

The total cost of the current research programmes is £15 million, and the current annual income of the Fund is approximately £6 million.

A copy of our 1986 Year Book is enclosed for any further information you may need.

In reply to your nine specific questions, we offer the following replies:

(a) The priorities in medical research are set in a variety of ways. The Medical Research Council would no doubt reflect the health needs of the nation.

In cancer, some 80 per cent of the direct research is financed by cancer research charities. The larger research institutions and charities are in membership of the United Kingdom Cancer Coordinating Committee. As far as the charities are concerned, priorities are set by their own assessment of need within the resources that are available. In general terms the reputable charities are aware of the needs, particularly those who have a disciplinary or subject interest. Most have supporters who are grouped throughout the country and often fully representative of patients and therefore possess through this means a wide spectrum of need.

The particular needs of the National Health Service are not always met in deciding the priorities.

(b) It is very difficult to say whether the present balance between different branches of research is right without being precisely aware of activities on all counts in the different branches. What is essential is that those research programmes which are producing new treatments for the benefit of patients should be given high priority.

(c) Priorities in medical research are often in the forefront of adapting to disease incidence and new technology. It is the National Health Service and the finance for it which should be changing

to accommodate new advances in improving the health of the nation. All too often medical research charities are subsidising the clinical responsibilities of the National Health Service in providing for the new and/or improved treatments.

(d) Priorities in medical research are indeed influenced by the medical research charities, and their tremendous work and initiative should be recognised by the Government. There should be more collaboration and cooperation between the medical research charities and Government on an equal footing on the question of priorities. Medical research charities especially work well with Government institutions through which research is funded, and leading medical research charities are not infrequently setting up their own major research programmes within those institutions.

(e) The results of research are adequately disseminated through the learned journals.

(f) Unnecessary duplication of research effort is best achieved by the Charity Commissioners taking more responsibility for vetting new charities, thus avoiding unnecessary overlapping with the existing established charities. Many of the smaller local medical charities, although well-meaning, dissipate resources and rarely achieve at local level any overall contribution to medical knowledge.

(g) The medical research charities are doing a great deal to promote improvements in health care and health education.

(h) This is best answered by the universities.

(i) Priorities should be set to maintain a supply of good and well trained researchers in the disciplines where need exists. Better research accommodation should be provided and the Government would do well to look at the facilities available in this country in comparison with those in the US. This is one of the major reasons why the good scientists—the ones we can ill-afford to lose—decide to work in the US.

G J Piller

May 1987

Memorandum by Professor Levy, Institute of Psychiatry

RESEARCH IN THE PSYCHIATRY OF OLD AGE

It has become a truism that medical problems associated with our rapidly ageing population constitute one of the main priority areas in medicine. This issue has been the subject of numerous official and semi-official documents notably the Health Advisory Service booklet "The Rising Tide". This concern has resulted in increase in staffing and in improved health service facilities for the elderly psychiatric patients. Unfortunately it has not been translated into similarly effective action in the field of research.

Two of the most important sources of morbidity in the elderly are depression which has a peak prevalence in the late fifties and remains high throughout the sixties to the eighties and dementia with a prevalence of 10 per cent of the population over 65 and 20 per cent over the age of 80. The bulk of cases of dementia suffer from Alzheimer's disease which has gradually been recognised as a specific morbid entity rather than an inevitable consequence of the ageing process.

At the time of writing none of the major grant giving bodies in this country are supporting any research on depression in old age and support for work on Alzheimer's disease is poor and very fragmented. No single centre in the United Kingdom has the whole range of expertise required to make a major advance in the elucidation of the complex causal nexus likely to underline this disorder and in advancing efforts to evolve effective forms of prevention and treatment. The pioneering work on the neurochemistry, neuropathology and nosology of Alzheimer's disease which was carried out in this country in the 1960s and 1970s has now dwindled to a low level and is being carried out by a few enthusiastic and relatively isolated research workers and clinicians. Training in research methodology is at an all time low and we have seen the usual sad spectacle of an initiative started in this country being exploited and developed by large well-supported research teams on the other side of the Atlantic. This is reflected by the impressive document entitled "Alzheimer's disease—a report of the Secretary's Task Force" published by the US Department of Health and Human Services in 1984.

In addition to these problems of funding there are other non-financial barriers to advances in these fields of enquiry which are outlined in the enclosed editorial (Levy, 1986). These difficulties are important in the context of the current debate about the state of research and development in the United Kingdom. The financial rewards for developing effective forms of treatment for these crippling conditions is likely to be enormous and unless there is a major shift of resources towards research and education in the Psychiatry of Old Age and the basic neurosciences associated with it, the benefits are unlikely to be reaped by this country.

Letter from Dr Brandon Lush, Friends of Age Research (Bristol)

I am responding to the request in the *British Medical Journal* of 21 March to send written evidence on priorities in medical research to you. I am a retired consultant physician who has spent most of his professional life in the administration of medical research in various capacities. I was on the staff of the Medical Research Council for 22 years and was Principal Medical Officer for the last 11. At different times I was Secretary of all their then Boards bar one, of which I was Deputy Secretary for a while. My final post there was as Head of the University, Grants and Training Awards Division.

In addition, I served on the Grand Council and Scientific Advisory Council of the then British Empire Cancer Campaign and other grant-awarding bodies, including several committees of the International Biological Programme.

On leaving the service of the MRC I became Chairman of the Mason Medical Research Foundation for many years and my old hospital (Frenchay, Bristol) have asked me to serve on the committee to administer the Edwin Luff Bequest for cancer research.

The remit of your Sub-Committee covers an enormous and extremely complex field and there are clearly no simple answers to any of the questions listed in the *BMJ*. Indeed, several of them overlap (for example 2,3,4, and 6-all of which deal with balance), so it is not possible to provide separate answers to them. However, I enclose a memorandum attempting so to do. It is necessarily somewhat superficial, but I will gladly try to elaborate on any points should the Sub-Committee so wish—either in writing or—preferably—orally.

Question 1. How are priorities for medical research met? How do these reflect the particular needs of the NHS or, more generally, the health needs of the nation?

There is no overall setting of priorities and the results of research only partly meet the needs of the NHS and the nation.

Medical research in the United Kingdom is supported and initiated by different bodies working largely independently of each other. Namely, the MRC, the DHSS, the universities, the pharmaceutical industry, those working in the NHS, private institutions and others. There is some collaboration between some of these, but it is necessarily limited for commercial and other reasons.

Research, by its nature, will always tend to reflect the interests of the investigators—and this will seldom, if ever, fully reflect the health needs of the NHS or the nation. Nevertheless, all medical research of quality will sooner, rather than later, be relevant to those needs.

At the basic, or fundamental level, it is initially impossible to know what relevance the work might have in medicine (for example Cesar Milstein's work on monoclonal antibodies, for which he received the Nobel Prize). What I wrote in 1961 remains a truism . . .

"One of the more popular misconceptions about research, not only in the medical field, is that there is a distinction (that is a clear or absolute distinction) between "pure" and "applied" research, with the corollary to the latter that research can be actively directed. The general concepts represented by the use of these terms are that the results of the latter form of research can be applied immediately, whereas the former is supposed to have no immediate application, being done purely for love of the pursuit of knowledge. To form these concepts is, however, to prejudge the issue, because their formulation necessarily implies knowledge in advance of the results. We can anticipate to the extent that any experiment is planned on the basis of a hypothesis and that this may prove to be right, but equally it may turn out to be wrong. Once new knowledge has been gained, it is, of course, possible to see whether or not it has any immediate application. Therefore, a better distinction than "pure" and "applied" is "short-term" research in the hope of solving some immediate problem of application and "long-term" research in the hope of trying to develop a basis for many different ultimate applications."
(p.213 *Concepts of Medicine*, edited by Brandon Lush, Pergamon Press, 1961)
(See also "Some Aspects of Medical Research in the United Kingdom", Brandon Lush, on pp. 162–4 of the enclosed *Bristol Medico-Chirurgical Journal*).

Question 2. (a) Is the present balance between different branches of research right? (b) Assuming that resources are limited, what programmes might be cut back in order to allow those that should be given a higher priority to expand? (c) What programmes need a higher priority? (d) Would priorities change in the light of increased resources?

(a) It is difficult to answer these questions without knowing just what is meant by balance. Presumably the question asks whether or not the "right" research work is being done in the right quantities, which begs the question as to what is "right". Undoubtedly, it seldom happens that the most important medical problems are investigated as thoroughly as many would wish and there are several reasons why that is so.

Firstly, it may not be possible to define the problem in a form which is soluble. Research implies the critical study and analysis of a defined problem. Unless the problem to be studied can be clearly defined at the outset, research is unlikely to solve it. Much time and effort can be wasted investigating a complex problem if it has not first been broken down into its component parts. Secondly, a problem will only be soluble by research if the relevant methods and techniques are not available. Thirdly, it is a truism to say that research workers work best on problems they themselves have set, although this should not be taken to imply that commissioned work is valueless. Rather, it is to emphasise the importance of producing trained research workers dedicated to the solution of problems.

(b) There is no limit to the amount of research which could be done if funds were unlimited. This will never be the case, so bodies administering research funds must always be selective in what they support. The degree of selectivity depends on the availability of funds. At the present time public funds appear to have become so limited that no further cutting back of existing work seems sensible. Of course some work is of higher quality than some other—but the real current need seems to be for more public funds for research.

(c) On the grounds that prevention is usually better than cure, a case can be made for increasing research on health education. Why is it so difficult to get people to stop abusing their bodies by over-eating, over-drinking, smoking, etc? There also appears to be a need for more incisive work in psychiatry, because mental illness is so prevalent. Other priorities might include problems of the elderly, the development of outpatient surgery and study of how further collaboration could be developed between the different bodies funding research.

Question 3. Are priorities in medical research adapting to changing incidences of disease, changing population structures, and new technology?

The answer is clearly "yes" to all three questions, although there will be differing views on the degree to which adaptation is adequate.

Question 4. (a) How are priorities in medical research influenced by institutions through which research if funded? (b) How does the balance between public, commercial, and charitable funding of research affect the setting of priorities by the different institutions involved?

(a) Bodies administering research funds necessarily concentrate on projects which will probably develop their field. This has been particularly so in the case of research on cancer. Being an emotive subject, funds have been more readily forthcoming than in many equally important fields with less public appeal. How to diminish this imbalance is a matter for discussion.

(b) The answer to this question is similar. It should be noted that Sir John Gray, when Secretary of the Medical Research Council, set up a joint committee with the major cancer research charities to attempt to minimise one of the above imbalances—and I think it would be generally agreed that this has proved useful.

Question 5. Are the results of research adequately disseminated?

This raises the question of disseminated to whom? In my view publication in the relevant medical and scientific journals meets the needs generally, although the growth in recent years of more and more narrowly specialist journals makes the existence of what can be termed medical newspapers, like the *Lancet* and the *British Medical Journal,* which screen other publications ever more important.

Question 6. How is unnecessary duplication of research avoided?

No body administering research funds will support a new research project unless it is satisfied that it does not duplicate previous work unnecessarily. The system of peer review should ensure knowledge of relevant previous work. Sometimes, of course, duplication is essential.

Question 7. Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?

Most advances in medical research affecting patient care unfortunately require additional funds—and these are seldom available in adequate amounts because there is always an inbuilt reluctance, stemming from the Treasury for the provision of funds for the currently unforeseeable.

Question 8. What changes in the training of medical research workers are needed?

Regrettably, there has been a marked falling off in recent years of the number of outstanding young doctors who are prepared to undergo research training because the career prospects have deteriorated—again primarily due to inadequate funding. The same applies, in large measure, to non-clinical scientists.

It is essential to improve career prospects for research workers—not only for the future leaders in the field but also for the supporters without whom they could not function.

Question 9. Should any specific changes in organisation or funding be made in order to increase the quality, quantity, or application of research?

The previous answers indicate that shortage of funds is one of the limiting factors but equally important, in my view, is ensuring the maintenance of the quality of those administering public funds for research.

It is a truism to say that good breeds good and not-so-good breeds not-so-good. Hence the need to make the relevant jobs adequately attractive to the very best people. The penalties for false economies can last for years and prove very difficult to eradicate.

March 1987

Letter from Mersey Regional Health Authority

Dr E M E Ramsay, Acting Regional Medical Officer, has asked me to respond to your letter of 17 November 1987 to Sir Donald Wilson, Chairman of the Regional Health Authority.

I am sorry this information could not be made available to you sooner. I hope this is the information you require. The figures have been provided by the Regional Treasurer's Department, and relate to the financial year 1986–87.

Two projects were commissioned by the Regional Planning Advisory Group, funded jointly by the Regional Health Authority and the District Health Authorities, with DHSS contributing the sum of about £30,000.

Project 1: Development of a regional user specification for the Patient Administration System. Cost £46,000

Project 2: Development of a Regional Information Strategy for:
- (i) Information requirements for planning;
- (ii) Evaluating existing information systems;
- (iii) Development of guidelines for development, procurement, funding, management, and training. Cost to date: £66,500. Outstanding commitment: £14,700. Total £81,200

Project 2 was initiated in 1986–87 and is to be completed in 1987–88.

Total cost of the two projects = £127,200.

I thank you for your kind attention, and apologise once again for the delay in replying to your letter.

Dr M Manche
Senior Registrar in Community Medicine—Mersey RHA

December 1987

Memorandum by Ms Bernadette Modell, Department of Obstetrics and Gynaecology, University College and Middlesex School of Medicine, University of London

PROBLEMS OF PART-TIMERS IN ACADEMIC MEDICINE

The Academic Board of the British Paediatric Association is interested in "increasing the amount and quality of paediatric research, recruiting research-minded paediatricians, and maintaining all levels of opportunity for their research to be fostered". I suspect that one of the most effective ways that the quality and amount of paediatric research could be increased, would be by improving the work opportunities for married women doctors who have a flair for research and wish to work part-time. This may be an appropriate time to consider this, since the majority of married women doctors with children would like to work part-time, and the proportion of married women in all branches of medicine is bound to increase fast in the coming decade, as a result of the changed admission policy of medical schools.

If it is accepted that the number of people really gifted for research is small, then for research to do well, the most important first step is to identify and support good research workers. In the coming years, an increasingly important number of these are likely to be women.

Until recently it was exceptionally difficult for married medical women to make full (or even fractional) use of their skills, but the opportunities for married women working part-time in service posts of the NHS, for example in general practice, and even in hospitals has recently improved considerably, as a consequence of, for instance, the married women's retraining scheme. However, these improvements do not extend in any way to married women doing academic or semi-academic clinical work, and paradoxically may even be detrimental to them.

What do part-time academic doctors do?

Since each of us has made our own way, we tend to see ourselves, and to be seen, as a "special case". However, this is a mistake. As a set of individuals trained in problem-solving, we have each considered the question of how to bring up a family and at the same time usefully deploy our academic and medical skills, and most of us have independently reached a similar conclusion. As a group, we have tended to become deeply committed in a small and apparently non-competitive area of medicine where we can try to preserve the triple approach (clinical medicine/research/teaching) on a reduced scale, and still produce a useful contribution. (Examples are urinary tract infections, thyroid disease, asthma, thalassaemia, ultrasound, premature baby follow-up, etc. etc.) There are many facets of hospital medicine especially suited to this approach, for example the long-term care of patients with chronic diseases (for which the rotation of registrars is simply too fast) or the development of new techniques whose value has not yet been proved. Most people who commit themselves in this way end up willy-nilly contributing to scientific medicine because of the depth of focusing and integrative approach they bring to their specific problem. *Our difficulties arise because we have appointed ourselves to a category of job that is needed, and is appropriate, but does not exist.* The following are some of the problems that may confront individuals hoping to follow this kind of career.

Obvious Problems

1. It is not possible to get on a medical school academic ladder because all established posts are full-time. This is reasonable in view of the demanding nature of the triple commitment to patient-care, teaching and research over a broad field. If you work part-time, you either have to choose one or two of the three, or narrow the field. And though I have heard of medical schools splitting an academic job between two women it is rather like ghosts—I've never seen one myself.

2. It is not possible to be on an NHS ladder unless one has taken a great deal of time to jump through all the hoops and acquire consultant status: and even though consultant sessions apparently could lend themselves to more juggling, it may still prove very difficult to work part-time. Many people with a gift for research arrive at their ultimate job by unusual routes, for example as mature students, so that acquiring the necessary paper qualifications may add a disproportionate length of time to formal training. Also, the increasingly stringent requirements for qualification by exam in order to pursue a particular branch of medicine are making achievement progressively more difficult for part-timers: they find they have to choose whether to use the limited time available to them for further training or for productive work. The married women's retraining scheme allows them to elect further training but only for service, not research, and this is in fact the only way that a married woman can get career opportunities in academic medicine at present, so all advisers, however well-intentioned, encourage part-timers to choose it. But for would-be research workers forced to follow this route, the effort to acquire the paper qualifications that will enable them to follow their interest constructively often becomes a prolonged exercise in sterility. This is why the married women's retraining scheme can in effect be counter-productive for the married woman research worker.

3. Bodies supporting research—MRC, Wellcome, etc. are all geared to helping the *young* research worker get started and get on a ladder. As a *result* of the lack of opportunity for older workers, they will not undertake even temporary support of a primary researcher of more than 32 (Wellcome) or 40 (MRC—but actually it's less) unless they can show evidence of being bound to get a permanent position in the foreseeable future "in case we get stuck with you". Since all have this policy, none can afford to deviate from it or they certainly will get stuck. No allowance is made for the fact that one would *not* be homeless at the end of a grant, on account of being married, or that since you work part-time you're not more expensive to support than a junior.

4. Unless you can show personal security for a number of years, granting bodies, reasonably enough, will not give you grants for junior staff, so development of one's work, however good it may be, is intrinsically restricted.

5. For all the reasons above mentioned, part-time research workers have low status. Since status means who you can talk to, the result is we can have little contact with our more senior colleagues outside our own department since we cannot meet them informally over meals, or formally at various committee meetings. We remain unknown. I bet no-one in the hospital could name more than three of us, if so many. Hence when we have a problem (which is most of the time) there is no way we can gain wider support for ourselves in the Medical School or Hospital. And when a question concerning our work or ourselves comes up at a committee, at present there is no way one of us can further our interests ourselves. We always have to work through a third party. In addition, our efforts to find financial support for ourselves

from outside bodies are greatly weakened if we cannot show the status that is an implicit sign of backing from our own institution.

Less Obvious Problems

6. We have a collective disability which could be called "lack of voice", and this is one reason why I think some body such as the BPA could usefully take an interest in us. All the others are the same as me—we go in, do our work and dash home again, contributing a minimum to the collective life of the institution. The work gets done but there is no time for lunch, meetings whether academic or not, and committees, all the places where people in general keep up their acquaintance and mutual ap- or depreciation. We are all intrinsically isolated. Lack of voice is partly due to low status, but not entirely. Even with high status, we would not attend most meetings, etc. *but* we would be able to do so when our interests were involved. And although we all have the same problem, by definition we don't even have the time to get together about it, never mind put our case forward.

7. Serious problems arise if our work goes too well. Most of us select a small area outside the main stream of the major disciplines: and often these areas are very new, or lie in the fertile territory between two or more disciplines. But if the work thrives, it attracts territorial attention, and then must be officially incorporated into one or other of the main Departments, which may not be the same as the Department it started out from. Because of their fringe position, part-timers are too often the pawns sacrificed in interdepartmental struggles, with little reference to the value of their work. As a result, the too-successful part-timer can suddenly find herself unqualified for her job which, now that she has consolidated it, has become important enough to be full-time anyway. I think I know three such instances at UCH and would be particularly interested to hear of more.

How we manage

When the 'slack' is removed from the system, the types of jobs described here are the first to go. It is now impossible to carve out a personal approach to research. Since all regular routes are barred to us, it is surprising that so many of us cling on to the fringe of academic medicine. Technically, most of us have done this through the patronage of a sympathetic Professor—a somewhat old-fashioned arrangement. Making the most of whatever opportunities present themselves, we manage to perpetrate our academic activities under a variety of disguises—clinical assistant, research assistant, married female re-trainee, etc. (this is one reason why I am sending this circular to nearly everyone) but another problem is that as one gets older such disguises wear thin. Now that the power of Professors is being eroded by increased interdepartmental competition due to shortage of funds, and a general trend to levelling, their ability to protect us is becoming curtailed and our situation is deteriorating. I think that most Professors who have been through one or two part-timers have found it a difficult experience and would be reluctant to support more.

Conclusion

A number of current developments in medicine are inimical to the development of good research. For instance, it is singularly distressing to see the opportunities for lateral movement becoming progressively curtailed, when we all know that the most important innovations come from the meeting of different disciplines and ways of thought, preferably in one mind. This is only one of several depressing trends. The group most affected by such pressures is inevitably the weakest group, that is the would-be part-timers, so the problems listed here are not ours alone. We are simply the ones with the worst symptoms. The underlying problems affect everyone in academic medicine. I do not think that a solution to our problems can be found within the existing administrative framework.

Suggestions

The problem really arises because we have appointed ourselves to a type of job that is needed, but does not exist. Perhaps this category of job should be made to exist; and in addition, perhaps the method of appointment by recommendation of a good department head should be legitimised. No doubt such a solution would call for money—I cannot see any constructive approach which would not do so. One might visualise a number of part-time clinical research posts allocated by competition, attached to individuals, but subject to periodic review and lapsing when the individual ceases to hold the post.

More specific suggestions

1. Describe the problem, for example perhaps we should establish the facts for married academic women in paediatrics—or even just in UCH.

2. Consider the question of modifying the required qualifications for married women who are clearly good in their field. This would *not* cost money.

3. Tell the students, so that the academically-minded women realise it is *more*, not less important for them to get their paper qualifications early by comparison with the men. This could be best conveyed through a set of lectures specifically by women on their special topic, but including some discussion of career problems.

4. Persuade medical schools to consider job-splitting, and to recognise the well known fact that two part-timers—one and a half full-timers; that is excellent investment despite apparent technical problems.

5. Put the case to granting bodies and request their views.

6. Philosophise. For instance, it strikes me as specially odd that medicine should be assenting to increasing pressures for everyone to work full-time at a time when under-employment means that people in general, including men, should be encouraged to work part-time if they want—the quickest and simplest way to increase the number of jobs available, while maintaining people's self-esteem and enjoyment of life.

Finally, I think that a more general awareness of the problems of part-timers should logically make things easier, though I suspect that the poor comprehension of what research really means by doctors in general, and the intrinsic competitiveness of research workers themselves, may limit progress that common sense would otherwise dictate.

SURVEY OF WOMEN DOCTORS AT UCHMS AND UCH

I decided to gather the views of some other medically qualified women, by circulating the foregoing account of the problems together with some suggestions for remedies, and a questionnaire. This was sent to all medically qualified women employed at UCH Medical School. The distribution of women doctors in the Hospital is shown in Table I (courtesy of Miss Sills). The circular was sent only to those in non-training NHS posts, that is, to all women Consultants and Clinical Assistants.

TABLE I

Distribution of women doctors at UCH (NHS)

	Male	*Female*	*Total*	*% Female*	
House Officers	18	12	30	40	
Senior House Officers	22	8	30	27	
Registrars	37	22	59	37	
Senior Registrars	37	9	46	20	
Clinical Assistants	16	26	42	62	
Consultants paid by NHS	79	8	88	9	8
Consultants with Hon. Consultant	56	1	57	2	

Conclusions

The overall picture is one of unbelievably restricted opportunity for women with children in academic medicine, and until very recently, in hospital medicine too. The figures convey the strong impression that the majority of young women doctors say to themselves: "Why should I kill myself to continue in academic medicine when the opportunities elsewhere, for example in General Practice, Community Medicine, and now in hospital medicine, are so much better?" And that is where they are going. The fact which really disappointed me, that relatively few young women doctors expressed any interest in research at all is probably one consequence of this. They leave hospital training at the end of a rotation of house jobs, or between the junior and senior registrar grades, and so are never exposed to research in practice, and you need this exposure to find out if you have a flair for it or not.

If this is true, it carries the following implication for the medical schools. Until now, since 80 per cent of medical students were men, the medical schools could draw on almost the whole pool of talent entering medicine. Now academic medicine is becoming increasingly unattractive for many reasons, and *in addition*, since medical graduates are now 40 per cent women, the pool of talent that could be drawn on by the medical schools has shrunk very considerably. If the medical schools recognise this situation, they will feel they should now try to make themselves more attractive to women who wish to have children.

The overwhelming consensus of UCH married women is that this could best be achieved by offering job-sharing, which nearly everyone seemed to want.

I subsequently turned to wider national figures (mostly supplied by the Medical Women's Federation) to see if my interpretation of events at UCH would hold water, and indeed it does. Women doctors with children want to use their skills—only 11 per cent of women doctors with children were not working at all, in a cross-sectional survey of women doctors in the Thames Regions (Beaumont 1978), and the majority of these had very small children. On the other hand, very few of them want to work full-time (Table VI).

TABLE VI

Distribution of women doctors in the NHS

	per cent of all women doctors	*Women as per cent of doctors in this grade*	*per cent Full-time With children*
Hospital training	32	10	22
Sen. post	20	10	3
Community Health	21	66	26
General Practice	27	14	36
General Practice 1978	Principals = 14% women Trainees = 44% women		

When women doctors escape from the training grades and can choose their final path, only 3 per cent of those in "senior" hospital posts (including clinical assistant) work full-time with children. 26 per cent of those in Community Medicine do so, but since this is such a woman-dominated branch of medicine, these probably represent women with grown-up children. Of General Practitioners 36 per cent work full-time with children. This seems an impressive figure until you realise that you only need to do 20 hours/week in General Practice to count as full-time for official purposes (allowances etc.). For this and many other reasons General Practice is especially hospitable to women with children, and it is not surprising that *44 per cent* of trainees for General Practice are now women. These are still drawn from a base of 30 per cent women or less, so the selective attraction of General Practice for women is very marked indeed. These figures all confirm the UCH-based conclusions, and make me feel very sorry for the 34 per cent of women Senior Registrars who are presently working full-time while having small children.

Letter from the Midwives Information and Resource Service (MIDIRS)

I read with great interest the reply which the Royal College of Midwives sent to your committee in answer to several questions you asked about medical research.

I am sure that you wish to know as much as possible about this important subject, and I am therefore writing to you to expand on the answer given by the RCM. While their document covered adequately the RCM's involvement in midwifery research, there are several other initiatives of which you should be aware.

The Midwives Information and Resource Service (MIDIRS) is a registered Educational Charity, run by midwives for midwives. Set up in 1985, our main service is the publication of three yearly information packs. These contain over 500 sides of recent research articles, abstracts, conference reports etc. As we have more than 3,400 subscribers, a large proportion of whom are midwifery schools and maternity wards, these packs are the most effective medium for the dissemination of midwifery research currently available.

In addition, MIDIRS has now established the first and only data base specifically geared towards midwives. Data entry is now proceeding at the rate of 150 entries a week and is already being used to answer enquiries.

MIDIRS runs an enquiry service for its subscribers. Any member who requires information about anything from labour ward policy to health service statistics can request a literature search and will be sent a list of references and photocopies of relevant articles. This service is also used by midwives undertaking research.

Your committee should also be aware of two relevant journals; Midwifery—a quarterly journal consisting almost entirely of articles describing research carried out by midwives and published by Churchill Livingstone and Midwife, Health Visitor and Community Nurse—a monthly journal which has some research articles relevant to midwifery and published by Newbourne Publications Ltd.

The contribution which the National Perinatal Epidemiology Unit makes to midwifery related research is enormous. I understand that the NPEU will be writing to you separately to describe their work.

I hope that this very brief outline will be of some use to you. If there is any further information which you require, or any way that we can be of assistance to you, please to not hesitate to ask. MIDIRS is

dedicated to the improvement of maternity care through the increased undertaking of research and its subsequent dissemination and application.

Jilly Rosser
Midwife Information Worker

January 1988

Memorandum by Professor R A B Mollan, Department of Orthopaedic Surgery, the Queen's University of Belfast

BACKGROUND

1 Outline of Personal Priorities

To carry out research which will benefit the patient with traumatic and other disorders of the locomotor system.

To establish and maintain areas of enquiry at the interface between medicine and the basic sciences/technology.

To foster and maintain multidisciplinary teams of clinicians, nurses, and scientists engaged on primary tasks but yet able to respond, in the short term, to problems in which special knowledge is needed, which might arise in other projects.

To foster and maintain personal, practical and tangible links with the Health Service by means of clinical effort, projects etc. and by responding to short term requirements for advice and technical support.

To initiate and support research into organisational problems of clinical demand, cost-effective delivery of health care, future trends and prevention of disease.

To support research effort and education at all levels in the Health Service thereby encouraging personnel to objectively evaluate their role and work in the delivery system.

To concentrate bioengineering effort in the area of *non-invasive* measurement of surface, movement and function.

To encourage teams of orthopaedic surgeons and histologists to concentrate effort on bone metabolism and articular cartilage damage.

To support and encourage data collection and evaluation of the health delivery system in particular to develop software and computer systems to deal with outpatient, theatre, waiting list and financial problems facing Health Service administration.

To ensure that any device suitable for commercial development is used to provide jobs in Northern Ireland and, if possible, foster medical electronics in the province.

2. Outline of Research Programme 1987

(a) *Bioengineering*

Development of non-invasive screeners for Congenital Dislocation of the Hip (CDH).
Biostereometric identification of the neonate with CDH.
Development of a knee screener for torn menisci.
Development of a knee screener to evaluate, non-invasively, the integrity of articular cartilage.
Investigation of Cavitation as a possible aetiology of osteoarthritis.
Use of lasers to measure the articular surface.
Ultrasonic evaluation of fracture healing and osteoporosis.
Development of a new plethysmograph to detect proximal venous thrombosis.
Prevention of deep venous thrombosis.
Home traction kit.

(b) *Hard tissue research*

Disappearing Bone Disease.
McCabe's Disease.
Vascular insult to bone.

X-ray irradiation of bone.
Cavitation damage to articular cartilage.
Ultrasonic evaluation of fracture healing and osteoporosis.
Bone pressure measurement.

(c) *Complications of treatment*
Hip revision techniques.
Deep venous thrombosis.
Heterotopic ossification.

(d) *Clinical research*
Cost of CDH early and late diagnosis.
Slipped upper femoral epiphysis.
War injuries.
Synovial chondromatosis.
Clinical screening for CDH.
Lumbar pain.
The calcium ion in trauma and disease.
The value of PEMFS.
The nature of the patella click.
Bone ingrowth into Decron implants.
Mortality from pulmonary embolism.
Knee replacement.

(e) *Organisational*
Cost of orthopaedic procedures.
Waiting list computerisation.
Five and ten year planning for locomotor disease.

My function is to be a practical, active orthopaedic surgeon with particular interests in problem areas of clinical practice for example lumbar discs, hip replacement and revision, knee surgery for arthritis, replacement and revisions, osteomyelitis, and shoulder surgery. Clinical competence and practice is essential to the direction and management of the interdisciplinary research undertaken by the teams. From this base a clear overview of the scientific and clinical aspects can be maintained which results in an efficient and cost-effective dovetailing of projects, expertise, manpower planning and career development. My job is to develop, plan, fund and direct each project. I am responsible to each team member to ensure that they obtain higher qualifications and develop their careers. I provide an academic back-up for my clinical colleagues to encourage them to have a greater involvement in research.

3 Reply to Specific Questions

(a) *Priorities for medical research*

At a local level I have been fortunate in that I was given an opportunity, before embarking on an academic career, to spend one year developing priorities for my own department. My senior colleague gave me the task of researching three major areas with the aim of identifying subjects in the locomotor system which were unique, clinically relevant, would provide decades of department research and which could be carried out without my personal involvement. Thus our department was able to start with a defined strategy based on 5, 10 and 20 year objectives. I was not permitted to do any practical research or publish any papers for one year, while this task was carried out.

I believe that our current success was directly as a result of the foresight of my senior colleague to ensure that a clear strategy was developed, discussed and then implemented. I doubt if many research departments carry out such an exercise.

I have the impression that many departments go "off the boil" because of initial poor long term planning and of a failure to reappraise strategy at suitable time periods. This process could be ensured by ten year cycles of reapplication for tenure as departmental head.

The departmental leader that is a practical, competent and acceptable clinician—as judged by his NHS colleagues—will ensure that research is to the benefit of the NHS and the National Health needs. However, at a National level I am not sure that this occurs. The system of DHSS representation to the MRC seems rather slow and cumbersome and appears to react to demand for funds rather than identifying areas of need or innovative development. I have approached the MRC on this point with the view of obtaining

discussion and support for objective non-invasive measurement systems to replace clinical tests and acumen. This implies a process of

(1) defining a clinical problem to be solved;

(2) major scientific input with clinical direction;

(3) as prototypes are developed and validated increasing the "medical" input as clinical trials are initiated;

(4) major medical R&D with scientific "back-up" while clinical value is assessed and modifications carried out;

(5) then another major scientific input, but more commercially orientated, as the prototypes are made suitable for marketing.

This is a process which demands vision, flexibility and reliance on project leaders. Unfortunately such long term research, of an obviously multidisciplinary nature is impossible under the present system. Component parts are difficult and frustrating to cog-wheel and as the years pass departmental heads get weary in the effort.

(b) *Balance in branches of research*

It is clear that Britain has good medicine and good basic science. There are huge areas of medicine that are still based on clinical acumen or practice. There are huge areas of pure scientific endeavour which have yet to be put into practical use. I believe that the priority in achieving a balance in the light of decreasing finance is to reduce "core" research in each of the areas and to develop the interface. In financial stringency we must "cash-in" our resources by bringing science and medicine together and demand that the National Health Service is improved by moving through the process of measurement to achieve objective diagnosis, subclinical detection, natural history, response to treatment, aetiology and finally prevention. In the process we can sell our machines to the world, save money by more efficient health delivery and fund more basic research as a positive financial balance is regained.

(c) *Rate of change*

Medical research is not adapting quickly to change. I have had particular problems convincing the more traditional and conventional funding committees that a multidisciplinary scientific approach is worth supporting. There seems a lack of vision, a suspicion of new ideas and innovation and a real lack of entrepreneurial drive in many areas of medicine. There is a deep suspicion of anything that might become a commercial success, yet this must be the ultimate goal of useful clinical research. Orthopaedic surgery is exploding with new technology yet in Britain this fact is only being slowly recognised instead of being turned to advantage.

(d) *Institutional control of research*

Each grant-giving body develops its own priority and this is vital to that institution. It does however lead to great inequality of funding. For example the Arthritis and Rheumatism Council gives the majority of its funds to Rheumatology while Orthopaedic Surgery, which has possibly provided more relief for the nation at a real cost saving, has the greatest difficulty attracting support. Public funds tend to favour "core" medical or scientific research and do not like the interface. Interface applications fall into "no-man's-land" between the MRC and SERC as each sees the other as being more responsible. Commercial funding tends to be market led. At the present time orthopaedic companies are taking profit, are manoeuvring for market share and failing to reinvest in research for the future. Commercial companies find medical research increasingly expensive and seem, at the moment to be relying on innovation from outside rather than investing in their own future.

(e) *Communication*

Research is very strictly refereed in Britain and this leads to valid results. It is, however, difficult to get a lead into new areas when bibliography does not exist and new concepts are ill understood. This results in a frustrating time lag between discovery acceptance and implementation.

(f) *Duplication*

Duplication can be avoided by good central control of funding for specific areas, identification of priorities and good communications. One of the great problems with UGC funding at the moment is that travel expenses for conferences have been cut savagely reducing the ability of researchers to find out what other centres are doing. By the same token, it is becoming increasingly difficult to develop personal relationships on which good interchange and collaboration is based.

(g) *Training*

Medical research training is grinding to a halt. Salaries in the academic sphere fall far short of NHS colleagues. In my own case my basic NHS/University salary could be earned a number of times over if I put the same effort into medico-legal or private practice. Orthopaedic academic training is a major area

for concern, Research funding is now a major problem and clinicians are just not putting the effort into trying to beat the system. UGC cuts in the Queen's Medical Faculty have resulted in a major reduction in the infrastructure on which research grant proposals are based. Retention of traditionally "strong" subjects due to voting power and time available to attend committees result in a squeezing of the emergent dynamic "small" departments who work rather than engage in politics. Trainees see the frustration, the major effects required to advance knowledge, the negative financial status and are just not prepared to make the sacrifice.

(h) *Organisation of funding*

If it is accepted that science must be brought alongside medicine and interdigitated, then a change in the priorities of the SERC and MRC must be made. Support for projects at the interface would lead to a change in the application of research and these areas could be dovetailed with National Health needs and those of the NHS by identifying priorities and encouraging certain centres to apply their resources to designated projects. Central research strategies must be developed but to ensure that they are relevant and useful an advisory structure consisting of active, committed clinicians who are research project leaders is vital. It is necessary to have advice from those who are meeting the clinical problem daily but yet know how it might be solved and understand the mechanisms by which the solution might be achieved. Good advice, refereeing, counsel and consultation will ensure quality. Central priority and coordination funding from different sources will ensure that there is little duplication making more finance available to increase the quantity of work. More use must be made of personnel within the Health Service to do good research but this can only be achieved by providing good multidisciplinary "back-up" in academic departments or NHS research institutes.

CONCLUSION

Nomenclature, legislation, finance and committees may not provide good medical research. The concept of the *research manager* must be fostered and supported. It is people, their ideas and dedication that will achieve the goal. Good manpower and management will achieve much more than increased financial resources. The *clinical academic* is the keystone of medical research and it is on this base the organisational pyramid should be based. The clinical academic needs the finance to speculate on his ideas. On his part he needs to make a major effort to communicate and collaborate with his scientific colleagues with the clear objective of producing real benefit for his patients.

Letter from Professor D C Morrell, United Medical and Dental Schools of Guy's and St Thomas's Hospitals, University of London

On the occasion of your visit to the United Medical and Dental Schools of Guys and St Thomas's Hospital on 7 May this year you kindly invited me to expand in writing on some of the comments I made during the final seminar. I am grateful to your Lordship for this opportunity to try to clarify some of the difficulties inherent in undertaking Health Services Research, and some of the problems which arise from the way it is currently organised and funded.

The Health Service is a very large and complex organisation. It attempts to provide a personal service to individuals and the population who present a wide variety of needs and demands. At a national level it must however, be concerned with the needs of the whole community and be organised to respond to these with an appropriate range of services. There is a potential conflict between the perceived needs of the individual and the service provided which is determined by the needs of the whole community. In order to minimise this conflict, it is vital on a continuing basis to identify need and to develop, evaluate and monitor the services provided. Health Services Research is concerned with health education, prevention and clinical care and relating this to the system of care provided in order to achieve maximum effectiveness and efficiency.

In measuring effectiveness and efficiency researchers are concerned with measuring the outcome of new methods of providing care not only at a personal but at a community level; determining costs and benefits; identifying priorities in the use of resources. Health Service Research therefore embraces a wide variety of disciplines including epidemiology, the behavioural sciences, clinical science, statistics and economics. It is also inevitably involved in studies at all levels of care from selfcare, through primary care to secondary and tertiary care and must therefore establish working relationships with providers of care at all these levels.

The major areas of interest in health services research may be summarised as follows.

1. Health Service Performance: This is concerned with measurement of access to care, the acceptability of care to the consumer, and the effectiveness and efficiency of the care provided.

2. Policies of Prevention: This area includes epidemiological studies designed to identify individuals and populations at special risk to disease and disability, and the need for delivery of programmes of health education, immunisation and screening.

3. Policies for Provision of Care: This is concerned with the evaluation of diagnostic, therapeutic and caring services and the planning and distribution of services in the community. It covers the whole spectrum of care from community care to high technology tertiary care.

4. Assessment of Health Status: This demands the development of methods to measure health and disease which may be applied to populations in order to indicate special areas of need and to determine the use of resources.

Because Health Services Research is so important to the determination of priorities in the distribution of resources, it inevitably takes place in a political environment. This may present serious problems if politicians demand immediate answers from health services researchers to problems which can only be solved by painstaking and sophisticated research methods. In this situation, politicians may be tempted to seek the services of commercial consultancies which have the financial resources to carry out investigations in a particular area of concern but with little background knowledge of the problem and no facilities for original research. They will produce answers because that is what they are paid to do, but these may be completely spurious.

This problem could be ameliorated in a variety of ways, but these do demand some major changes in the way health services research is used and funded by the Department of Health.

1. The Department of Health should have a coherent research strategy which identifies in advance likely areas of potential concern and encourages researchers to work in these areas. Such a strategy is not currently apparent.

2. Research units should be imaginative politically in the work they undertake. On the whole they have a good record in this respect. This department for instance anticipated the need to evaluate multiphasic screening; early discharge from hospital; measurement of health and growth in primary school children; the value of community based antenatal and diabetic care; long before these became political issues.

3. Communication between planners and administrators of health care and the health services research units should be greatly improved so those in a position to change policies can have access to the knowledge available in research units and unit directors can have knowledge of the direction of new initiatives. A recent example in which the DHSS invested tens of thousands of pounds in a commercial consultancy to obtain information already available in this research unit demonstrates the total lack of communication which currently exists.

4. The DHSS should recognise that health service research units contain individuals who have the necessary expertise to carry out well informed literature searches and provide answers to a variety of problems. Appropriate funding however, will be necessary to make it possible for the unit to undertake this service.

5. The DHSS and politicians should accept that health service research units are built up around scientists who would look objectively at the problems presented to them and give opinions based on the scientific evaluation of facts. Inevitably, this will at times mean that current government policy is questioned or rejected. The alternative of employing consultants from the City at great cost must in time threaten the credibility of the government's commitment to obtaining and using reliable information.

Much of Health Services Research requires considerable collaboration between researchers and those providing the services. Clinicians concerned with providing optimal care for individual patients, may sometimes be reluctant to assist in research which questions their provision of care (for example randomised controlled trials) or the priority they accord to particular advances in medical technology. Effective collaboration will be best achieved with the managers of Health Service Research in a position to influence both sides and the research groups integrated with the primary and secondary care services.

Another problem for Health Service Researchers is that of ensuring that findings are used appropriately. This does not, currently, seem to be the case. There needs to be an effective way of ensuring that reports and reviews of relevant work are commissioned and used in DHSS decision making.

Health Services Research is essentially multi-disciplinary. For the quality of research to be maintained and improved it is necessary for able people from a variety of disciplines to see the move from a pure discipline into applied research as leading to a soundly-based career. This is not an argument for tenure for researchers, who should continue to be judged by what they produce. It is an argument for ensuring that their prospects are at least comparable with those in single disciplines in universities. At the moment many of them are maintained on very short term contracts subject to the vicissitude of governments in their financial commitments to research.

My final comment is concerned with the current organisation of health services research. The Rothschild customer/contractor principle envisaged that the DHSS would invite tenders from Health Services Research units to undertake research of particular interest to the Department. In fact most research has taken place

because contractors have suggested important areas of enquiry and have then had to wait often for a period of up to one year for the DHSS to find a customer and approve the research. In some cases this has led young innovative researchers to abandon this field in frustration at the Department's inability to make decisions.

Practice falls short of the ideal and it would appear that the Department has no real commitment to research, has no obvious research strategy and no mechanism to identify the research needed or to coordinate the application of the results of completed research to the provision of care.

This is reflected in the fact that many units, which have been in existence for 20 years and have provided information which has saved the health service millions of pounds and improved the health of the community, still have no career posts providing continuity of employment. This inevitably results in a shortage of trained researchers and it is indeed difficult to see how any competent research worker will be attracted to this field in the future in this country, particularly, when other countries take Health Services Research more seriously and are prepared to pay for it.

I realise that this letter has been rather a catalogue of difficulties facing Health Services Research. I would like to conclude by some positive recommendations for the future.

I believe that Health Services Research is vitally necessary to maintain and improve the effectiveness and efficiency of the Health Services and that it has been woefully neglected in the past few years. If this is accepted there is a clear need for change.

There are two main options. The first is to retain the research management function within the DHSS, but improve the way it interacts with the service management structure and the research community. The second is to move the responsibility for research management from the DHSS to a new Research Council or Special Health Authority.

For the first option to work successfully, quite radical changes would be needed. To ensure effective commitment to Health Services Research it would need a member of the NHS Management Board to be identified as Director of Research and responsible for its budget. It would also need the DHS research management team to have the appropriate organisation and influence to ensure the efficient circulation of information and collaboration between researchers, service providers and the policy and decision makers.

The second option would be to require that an organisation outside the DHSS is identified or created and given the resources and power to manage the nation's Health Services Research independently of those administering or providing the Health Service. Such an organisation would have to be able to identify a research strategy, supervise and support the multi-disciplinary research teams necessary to do the research and create the communication and collaborative links between the service providers, policy and decision makers and the researchers.

If no action is taken it seems probable that scientists will drift away from Health Services Research. This would be disastrous and totally contrary to the present government emphasis on value for money.

Letter from the MRC Physiological Systems and Disorders Board Grants Committee A

We write as members of Grants Committee A of the Physiological Systems and Disorders Board because we wish to add our weight to the body of evidence presented to you that Government funding for biomedical research supported by the Medical Research Council is grossly inadequate.

The goad that provoked us into action was the announcement at the start of this funding year that the budget for project grants will be cut by 20 per cent. We were conscious in our work in Committee last year that excellent projects were not being funded and the present decision means that even better researchers in the scientific community, faced with rejection, will probably retire bruised from the competition and disillusioned about their professional future in the United Kingdom.

We are also concerned about the increasing call upon charitable organisations to bridge the gap in funding basic medical research. The Government must not shirk its proper responsibility, by allowing money given by private citizens and organisations to replace funding which should come from the Treasury coffers.

In sending this letter we seek to fulfil not only our responsibility to the Medical Research Council but also to our colleagues in the scientific community at large.

Professor R D G Milner	Dr C C Ashley	Professor M M Black
Dr G R D Catto	Dr P de Bono	Dr F De Matteis
Professor M E Grant	Professor A Guz	Professor C C Michel
Professor P J Piper	Dr J Reeve	Professor J L Reid
Dr I P Trayer	Dr E D G Tuddenham	

December 1987

Memorandum by the Multiple Sclerosis Society of Great Britain and Northern Ireland

INTRODUCTION

The Multiple Sclerosis Society of Great Britain and Northern Ireland was inaugurated in 1953 with the dual objectives of promoting and encouraging research into finding the cause and cure of Multiple Sclerosis and providing a welfare and support service for those families one member of which suffers with this condition.

The Society is now the major funding body for Multiple Sclerosis research in the United Kingdom. The Society relies on a Medical Research Advisory Committee comprising of clinicians and scientists in the disciplines of virology, immunology, biochemistry, pathology and pharmacology, for advice and recommendations as to what research projects should be supported. The Society receives applications from hospital and university departments and each of these applications is first considered by the Research Advisory Committee. The Committee also benefits from the assistance of outside referees. Most applications funded relate to basic science projects, judged to be relevant to the problems of the disease, but clinical research projects are also funded when deemed suitable.

The Society also funds post doctoral research training fellowships with a view to encouraging more young scientists and can respond rapidly to investigate new initiatives which arise as a result of published work in other areas. Where it is felt appropriate, the Society will then commission work in such areas.

Recently, the Society has made an Award of £$\frac{1}{4}$ million for a programme grant which was advertised throughout the medical journals. The purpose of this competitive Award was to endeavour to attract and provide support for a new group. The successful group is now being encouraged to make further project grant applications.

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

The priorities do not reflect the immediate needs, grant-giving bodies have to be opportunistic and not rigid, they have to harness interest, enthusiasm, personal preference, previous training and existing facilities. The research councils are unwilling to involve themselves in disease-orientated research and attempts by the MRC to direct research into specific areas, have frequently failed except perhaps with their units. Unfortunately, the demyelinating disease research unit was shut several years ago. Rarely can the MRC respond immediately to a need to change direction. Charities which are capable of being less rigid, are able to respond to such needs and encourage disease orientated research.

At the inception of the National Health Service, it was planned that research would be given a priority, but in practice this did not work. The Rothschild Report was an attempt to redress the balance and to provide money for commissioned research dictated by the patients' needs. This proved to be unworkable, so the Department of Health was moved to rely on the MRC to deploy the funds that had been diverted to them.

The priority of medical research must be to fund those projects judged to be of first class scientific merit with relatively little reference to the needs of the National Health Service.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

The present financial cutbacks are altering the balance by affecting the number and quality of young research workers and this threatens the whole future of United Kingdom medical research. The priorities must always be good science, bad science should not be supported just because it is linked to particularly favourable areas, such as sociology, geriatrics and psychogeriatrics.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

In the main, priorities are adapting to changing incidences, for instance with the increasing age of population, more psychogeriatric research of high quality is being undertaken. The science councils, because of their rigidity, seem not to be able to respond as rapidly to such changes as may be necessary.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

Specialist institutes have their own priorities in their own subjects as do the medical charities, but most resources of all bodies are devoted to basic research but immediate patient needs are not neglected. The MS Society for example has supported research into the problems of incontinence, bed sores, and the development of aids to improve the mobility of incapacitated patients. The research councils tend to take no chances; they support success, that is groups with a good track record and therefore cannot really be innovative. The charities encourage new ideas and are more prepared to risk backing the wrong horse. Commercial funding has been immensely valuable and has been responsible for the development of the majority of patient related research. Obviously, however, this has had to be directed with commercial gain in mind. The nation's good has been well served by commercially based research, but it must be the responsibility of the councils and the charities, to fill gaps in areas where there may be no obvious financial incentive.

(e) *Are the results of research adequately disseminated?*

We believe that research is adequately disseminated through the scientific literature, international research reports, meetings of grant holders and learned societies' meetings. It is felt that grant holders meetings as organised by the Multiple Sclerosis Society, might be repeated elsewhere. Also workships on specific subjects are also of great value in stimulating cooperative research between departments and countries.

(f) *How is unnecessary duplication of research effort avoided?*

As in (e), but in addition grant holders are required to submit annual reports and grant giving bodies avoid unnecessary duplication by deciding how their research resources should be allocated.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

Yes, as anyone who has lived through the dramatic changes that have taken place since the 1930s in patient care and health education will know. More specifically, properly organised clinical trials have saved resources being wasted on ineffective treatments (for instance hyperbaric oxygen, various dietary regimes etc.).

(h) *What changes in priorities in the training of medical researchers are needed?*

The changes in priorities in training must be aimed at a more effective career structure. There is a need for more training fellowships, PHD studentships and the encouragement of the intercalated ESC course for medical students which has recently been halved, thus decreasing the supply of scientifically orientated doctors. Research has become a less attractive career because of the poor supply of tenured posts and the increasing difficulty in obtaining research funds. The value of scientific research training to clinical medicine cannot be over emphasised. There is a need for a greater recognition of the value of the interchange between academic medicine and the NHS, but to be able to keep sufficient numbers of people in academic medicine, there must be sufficient senior jobs to prevent them all drifting into NHS work.

(i) *Should any specifc changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

The answer to question (h) is relevant. Funding is grossly inadequate, MRC project grants are not being funded, even though the work of the project is judged to be scientifically excellent and to be deserving of support if funds were available. It seems unfortunate that a considerable proportion of the research council's budget is directed towards established centres where the work that is ongoing appears to be subjected to much less critical evaluation than are often more superior projects outside the established centres and that therefore find it more difficult to attract funds. It also seems as though the science councils may lack the flexibility that could be encouraged by the re-establishment of coordinating committees between the MRC and the charitable grant giving bodies, working in specific areas.

April 1987

Memorandum by the Muscular Dystrophy Group of Great Britain and Northern Ireland

The Muscular Dystrophy Group is a registered charity (No. 205395) which was established approximately 25 years ago to raise money to fund research into the muscular dystrophies and related neuromuscular diseases. Today, whilst the primary aim of the Group remains the support of research, a small but increasing proportion of the Group's income is devoted to the provision of medical services.

The work of the Group is set out in the accompanying Report, from which it will be seen (pages 8–12) that roughly 60 per cent of an income now approximating to £3 million per annum is spent on research.

The Group has no laboratories of its own but supports work in Universities and Hospitals by means of grants.

The scientific policies of the Group are determined by its Medical Research Committee which presently has the following composition:

Professor P Lachmann, FRS (Chairman)
Professor M Bobrow
Dr Margaret Buckingham
Professor V Dubowitz
Sir Andrew Huxley, FRS
Professor J Lucy
Professor D Marsden, FRS
Professor J Newsom-Davis
Professor V Perry, FRS

There is some support for research into most of the neuromuscular diseases. However, the opportunities presented by recombinant DNA technology have been particularly supported in recent years in order to discover the precise genetic abnormalities giving rise to the inherited neuromuscular diseases. As a result the defects producing Duchenne muscular dystrophy have, in part, been elucidated and progress has been made in the understanding of Emery-Dreifuss and myotonic dystrophy.

The Committee is now considering the need to support more protein chemistry in order to understand the function of the gene products.

In answer to the specific questions:

(a) Priorities are set by the Medical Research Committee, but are concerned exclusively with improving the understanding of the neuromuscular diseases with the object of finding effective treatments and ultimately cures for these diseases. Such objectives, if obtained, would reduce the load imposed on the NHS by these presently incurable and fatal diseases.

(b) A "middle-sized" charity such as MDG cannot involve itself in long-term research. At the present time the Group's effort to elucidate the genetic causes of "our" inherited diseases (like the efforts of other charities involved with specific inherited conditions, for example cystic fibrosis, haemophilia) is possible because of earlier fundamental work initiated 20 years ago by the Medical Research Council at MBL, Cambridge and elsewhere. The MDG regrets the present financial constraints being placed on the Research Councils (including the MRC) since it sees no practical alternative method for the support of long-term fundamental research.

(c) The incidences of the diseases with which the MDG is concerned are not changing. The frequency of Duchenne dystrophy (the commonest form of muscular dystrophy) is the same in different ethnic groups and is maintained by a very high mutation rate.

(d) Increasingly the research supported by the Group is "commissioned" and does not arise as a result of applications submitted de nova by researchers. This represents a change from past practice and is still at a preliminary stage. Nevertheless the Research Committee does increasingly grasp the opportunity of "negotiating" research grants rather than responding passively to requests put before it. The Group looks to the public sector for the support of fundamental, long-term objectives, and to commercial organisations for "development" work. To date our experience with pharmaceutical companies is similar to that of the larger Muscular Dystrophy Association of America, namely that there is no great interest in "rare" diseases. However, this attitude may change following the identification and sequencing of some of the gene products.

(e)(f) Research results are disseminated by scientific papers which are adequate for the scientific community. However, the Group is conscious of the difficulty of communicating advances to its lay members. Duplication of effort in the particular fields of concern to the Group are *generally* avoided by good communication with other similar charities abroad (for example MDA in USA, EAMDA in Europe).

(g) The recent experience of the Group is that neither the DHSS (through central funding) nor the NHS can *rapidly* provide new services. Diagnostic DNA services are an example. Carrier detection and foetal screening for Duchenne muscular dystrophy have improved dramatically in recent years as a result of recombinant DNA technology. DHSS belatedly initiated three "supraregional DNA centres" (at Great Ormond Street, Cardiff and Manchester) to provide diagnostic services, but these have proved inadequate to the need.

The Group has therefore set up two further comparable Centres (Guy's Hospital and Newcastle) and has been content to provide this service, anticipating that the cost would be carried by the NHS after two to three years. At present it does not appear that the Health Authorities can accept this additional burden.

(h) Clinical research is at a low ebb in this country, and it would appear that an increasing gulf is developing between "preclinical science" and the assimilation of this work into the clinical field. The present reduction in the number of registrar and senior registrar posts available for research will surely widen this gulf.

(i) The Muscular Dystrophy Group sees no need for fundamental changes in the organisation of medical research in this country. Hopefully the reorganisation of the Association of Medical Research Charities will provide the possibility for more efficient exchange of (administrative) information between the public sector (DHSS, DES, UGC and ABRC) and the private sector regarding specific interests of individual charities or private foundations.

The apparent lack of adequate communication between DHSS and DES in the field of medical research (and training) remains a problem but not one specific to an individual charity. It is a matter of greater concern to AMRC, and it is assumed that a submission will be forthcoming from that organisation.

Letter from the National Association of Health Authorities

Thank you for inviting us to submit evidence to the enquiry being carried out by the House of Lords Sub-Committee into medical research.

I am sorry that our comments will be received beyond your deadline but hope that they do not come too late to be of use.

NAHA is not directly involved in medical research but has been interested in the subject for many years mainly under the auspices of the Teaching and Research Committee. We have been particularly concerned about the effects on medical research of the reductions in UGC grants. Where the funding of clinical academic posts is transferred from the University to the health authority on service grounds often the research element of the post is lost. I enclose a copy of our latest report on this subject "University Funding and the NHS: The 1986 Review".

The Teaching and Research Committee considered your request for comment on the nine specific questions at its meeting in April and made the following points. By the nature of the work of the Committee these comments will be of a general nature but I hope that they will be helpful.

(a) In discussing how the priorities for medical research are set the role of the Medical Research Council was emphasised. It was felt that their role was crucial in establishing the priorities for centrally funded research. It was feared, however, that the priorities were set on the basis of applications for research funding received rather than being initiated by the MRC. No doubt the needs of the NHS and the health needs of the nation are borne in mind when examining these research applications.

Outside centrally-funded research the priorities for research will be set by the particular interest group or commercial organisation involved. They will reflect the narrow interests of the groups or the commercial considerations of companies rather than an overview of the needs of the NHS. While many highly beneficial results accrue from this research, concern was expressed that this "soft money" research far outstripped centrally financed research, in terms of resources available.

(b) It was not felt possible to comment on the present balance between different branches of research as adequate information on this was not available. However, concern was expressed that the "cinderella" specialties and applied research, which do not attract funding from "soft money" sources, were not receiving adequate attention. Given the recent reductions in both UGC and MRC funding, obviously priorities for centrally funded research would change with the availability of increased resources.

(c) The recent research projects in AIDS were instanced as evidence that medical research could adapt to changing incidences in disease. Regarding changing population structures, the needs of the growing elderly population were not felt to be receiving adequate research attention.

(d) According to evidence submitted to NAHA by health authorities for "University Funding and the NHS" the priorities in medical research are greatly influenced by the means by which research is funded, those projects funded by "soft money" receiving greater funds and thus greater priority. The potential for research funding by RHAs was acknowledged and it was agreed that more encouragement should be given by RHAs to consultants to research in their field and also funding for applied research in hospitals. The resource implications for RHAs of such activities however were clearly understood.

(e) It was felt that the results of research were adequately disseminated at the completion of research but that more dissemination of progress and sharing of ideas at every stage in the research process would be of benefit to the NHS as a whole.

(f) The benefits of a central "clearing house" to monitor research and avoid unnecessary duplication of effort was emphasised.

(g) Often the resource implications of research projects are not considered and health authorities cannot afford to implement expensive new treatments, new technology etc. In the health education field research findings can meet resistance from vested industrial interests.

(h) Medical researchers should be trained to consider the resource and manpower implications of implementing research findings. It was also felt that researchers should receive training in making applications for funding as this was crucial in obtaining support and in aiding the funding institutions to choose their priorities.

On a general note NAHA welcome the enquiry being carried out by the Sub-Committee and think that the questions posed in your letter are all extremely relevant.

Please let me know should you require further information.

Philip Hunt
Director

May 1987

Memorandum by the National Society for Epilepsy

Introduction

The National Society for Epilepsy (NSE) is an independent organisation founded in 1893 and it provides a range of services for people with epilepsy. Its funds are drawn from three sources: the DHSS via the National Hospital for Nervous Diseases to provide an assessment facility, the DHSS and Local Authorities to provide residential care and charitable donations.

The NSE has a well established tradition in scientific research dating back to the 1960s when some of the early work on phenytoin kinetics was undertaken at its headquarters, the Chalfont Centre for Epilepsy by Alan Richens (now Professor of Pharmacology at the University of Wales College of Medicine in Cardiff).

The present Medical Director, appointed in 1979, has continued and expanded the research effort which is now under the direction of Dr Simon Shorvon.

Funding of research at the National Society for Epilepsy

As an independent organisation and a registered charity, the NSE has access to charitable funds, some of which (£24,000 in 1987–88) are allocated to research. This amount pays portions of salaries of those permanent staff who participate in research. However, the NSE is also heavily dependent on grants (such as from the Brain Research Trust and British Epilepsy Research Foundation) and income from the pharmaceutical industry to undertake specific projects. The NSE has attracted funds in excess of £100,000 in the last year from these sources. The NSE does not currently have funds to support research by other individuals or bodies but, if funds became available, such a development would be permitted by our Articles of Association. The only source of funds dedicated to epilepsy research in the United Kingdom is the British Epilepsy Research Foundation (British Epilepsy Association, 40 Anstey Square, Leeds).

Specific Issues

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

It would be reassuring to think that there is some overall plan and set of priorities for health care in general and medical research in particular. There is little evidence that this is the case. Impetus for innovation in both areas appears to be largely either reactive (for example AIDS) or due to personal initiative. Much of epilepsy-related research is, quite properly targeted at developing new and better treatment. This embraces the development of new drugs and the better use of existing ones. The impetus for the first of these has, quite clearly, a substantial commercial motive although underlying this there is often a strong element of personal initiative (such as in the development of GABAergic compounds as potentially useful in the treatment of epilepsy).

This author feels, somewhat cynically perhaps, that very little of this initiative stems consciously from a desire to improve the health of the nation. It is said that very few resources are ploughed into research on preventative strategies. It is to be doubted whether the pharmaceutical industry (which is a major source of the NSE's research funding) would ever be interested in this. The only form of prevention that seems to motivate this sector (and it is currently a very powerful factor) is the avoidance of toxic effects of new drugs. Regulatory bodies seem to share the view that potential toxicity outweighs potential benefit in assessing new compounds.

In summary, therefore, priorities are to some extent set by personal interest of the researcher but particularly by the availability of funds. The author suspects that attracting funds to evaluate medical procedures [such as the cost effectiveness of epilepsy clinics as advocated by the DHSS Working Group (HMSO, 1986)] would be very hard to come by.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

This is exceedingly difficult to answer because there is no agreed policy on health issues. And it is difficult to envisage any such policy being agreed. Health issues are perhaps too emotive. Without wishing to minimise the importance of some new techniques and treatments, which were born out of research, the author feels that there is an undue emphasis on the importance of the "new" and not sufficient evaluation of existing procedures—sometimes these can take place in tandem, however. The most important development in the treatment of epilepsy in the last ten years has probably been the advent of serum drug level monitoring. This allowed more accurate use of existing drugs (tailoring the dose to the individual patient) and thereby permitting the now extensive use of single drug treatment (monotherapy). However, monotherapy too had to be subject to research scrutiny before becoming widely accepted. So there are dangers in attempting to determine priorities between new developments and better practice. Nevertheless, the author feels that insufficient attention is given to research into effective practice. For example, one well known problem with all drug treatment is non-compliance (failure to take treatment as prescribed). Without attributing blame for this situation, the waste in terms of cost of the drugs and medical time is likely to be considerable. But the causes and remedies for non-compliance is not a burning research issue.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

As the prevalence of epilepsy probably has not changed significantly in the United Kingdom, this is difficult to answer directly. There is still very little research, to my knowledge, into prevention of epilepsy or the appropriate management at an early stage with a view to finding out if this affects long term prognosis, that is the prevalence of intractable epilepsy. Better community based studies of epilepsy rather than just based on hospital populations have lead to a more accurate appreciation of the natural history of the disorder.

New technology has always been an initiator of research and certainly it opens new doors. Microcomputers allow storage and analysis of data that would otherwise have been unwieldy. Whether computer based statistical analysis always yields clinically important results is a different matter. The importance of serum level monitoring (based on new technology) has had an important effect on both clinical and research practice.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

Organisations such as the NSE are heavily dependent on funds from the pharmaceutical industry not only to provide resources to carry out drug studies but to fund research posts. The post holders often undertake additional studies (not related to the interest of the drug company) and also and importantly participate in the clinical care of patients. In this way research funding also supports the overall care of patients.

A period of research, preferably leading to a higher degree, is still widely regarded as being important for career development and in highly competitive specialities, like neurology, is more or less essential. Funds, however, are not always immediately available and those that are may already be linked to some specific project.

(e) *Are the results of research adequately disseminated?*

There are a number of problems connected with this. Scientific journals often take a very long time to publish papers even though they have been accepted after due scrutiny. This may cause duplication of effort because of ignorance of other workers' efforts. Scientific meetings can also be a fruitful forum for exchange of information but sometimes quality control of data presented at meetings is rather lacking because of the need for meetings to be financially self supporting. There are also international barriers to dissemination and a considerable number of duplicate studies are carried out in Europe and the US, particularly in the field of drug development. This is partly because of the demands of national regulatory bodies and partly because of other, perhaps more personal, reasons.

(f) *How is unnecessary duplication of research effort avoided?*

It has to be said that duplication is not always unnecessary and indeed is often required by regulatory bodies for new drug development. Also if studies are controversial or if innovatory techniques are used, the results should not always be accepted at face value.

However, the phenomenon of "me too" studies is well known. Perhaps rather few of these penetrate the scrutiny of referees for the better journals and certainly knowledge that a study is unlikely to be published is a major disincentive to the research. For a variety of reasons, sometimes related to requirements of regulatory bodies, studies are duplicated in several countries. Sometimes new information comes to light (such as the toxicity of sodium valproate in US studies). Some form of central registration of studies in progress might help to reduce unnecessary duplication and make sure that parallel studies were more directly comparable.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

I am sure that this happens eventually but there are a number of barriers to speedy implementation of new practices and therapies. In part this relates to the requirements of regulatory bodies but also to the inherent slowness in changing clinical practice. For example, there are still physicians in the United Kingdom who prescribe phenobarbitone for epilepsy or drugs in combination after initial diagnosis despite overwhelming evidence that neither treatment is appropriate. Unfortunately, there is no system of professional accountability in terms of modern practice and no obligatory requirement for Continuing Medical Education (CME) as there is in the USA.

(h) *What changes in priorities in the training of medical researchers are needed?*

This question assumes that there is any formal training for medical researchers. Many junior doctors in training for consultant posts undertake a period of research lasting two to seven years, often for a higher degree. The pressure to complete the project often with an ongoing clinical commitment does not really allow for adequate training in basic research techniques. Those appointed to academic jobs may have a greater opportunity. In my experience there was little or no training in resource or personnel management training.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

The inevitable answer is more funds. But initiatives to reduce the "hand to mouth" system of funding research programmes would be welcomed. A more attractive career structure would also be beneficial.

Letter from the National Society for Mentally Handicapped People in Residential Care (RESCARE)

RESCARE is run by elected honorary appointments, without paid staff or public funds, but enjoys the support of 60 affiliated parental, relatives, staff and friends organisations active mainly in, or for, hospital homes for people with a mental handicap. Our membership also increasingly includes local Mencap societies, other groups within the community, and substantial numbers of individuals.

Considering the number of beds occupied by mentally handicapped people and the numbers of people affected nationally we feel that much more effort should relate to the diagnosis, prevention, and treatment of the condition.

The move to community care for the mentally handicapped, and especially the policy of closing hospitals for the mentally handicapped (which we currently oppose), is based on, and is accompanied by, totally inadequate research about the effects on individuals, and on communities. Work of the quality of that done by the MRC Unit of Social Psychiatry under Dr Wing in the Darenth Park closure study needs to be substantially increased otherwise public policy may continue to increase expenditure without actually improving the lot of most people with a mental handicap.

R S Jackson
Hon Chairman

April 1987

Memorandum by the National Environment Research Council

A SUMMARY OF RELEVANT RESEARCH SUPPORTED BY NERC

1. Introduction

1.1 The information below relates to current research at the following NERC Institutes and Associations:

Institute of Terrestrial Ecology (ITE)
Freshwater Biological Association (FBA)
Institute of Hydrology (IH)
Institute of Virology (IOV)
British Geological Survey (BGS)
Institute for Marine Environmental Research (IMER)
Marine Biological Association of the United Kingdom (MBA)
Institute of Marine Biochemistry (IMB)

1.2 Our work at NERC laboratories is supplemented by research grants and training awards to academic departments and a number of "Special Topics". The Special Topic scheme provides directed support for multidisciplinary and collaborative research in areas of high scientific priority and currently include Biotechnology, Animal Ecotoxicology, Agriculture and the Environment, Air Pollution Effects, Atmospheric Chemistry and Environmental Radioactivity.

1.3 We have recently provided evidence for the House of Commons Environment Committee Investigation into the Pollution of Rivers and Estuaries and the Royal Commission on Environmental Pollution studies on Freshwater Quality and on Genetic Manipulation. In addition, NERC has contributed to the publication of Department of the Environment studies of Long Term Water Research Requirements and the report on Nitrate in Water during 1986. Your Sub-Committee may find reference to these sources of interest.

2. Pollution of terrestrial environments

2.1 The ITE is pursuing ecotoxicological studies on the effects of organic pesticides and industrial pollutants such as heavy metals and PCBs on birds and mammals. This work is linked to basic physiological research on the control of reproduction and the ways in which this is affected by pollutants. Current work of relevance includes the toxic effects of wood preservation treatments (pesticides such as Lindane) on bats and the production of toxicity data profiles for a range of pollutants for the World Health Organisation and the IRPTC.

2.2 Studies on the effects of atmospheric pollution, including "acid rain" on trees and crops are underway at ITE. This is complemented by investigations at institutes and in academic departments, supported by the Special Topic on "Effects of Atmospheric Pollution on Forests and Crops" which considers mechanisms underlying damage to trees and crop plants by gases and ways in which damage might be limited.

2.3 A radioecological group set up within ITE in 1979 has been providing a baseline for research into the pathways and fate of radionuclides derived from the nuclear power industry. Studies included the effects of land use practices on radionuclide distribution in Cumbrian soils and vegetation and the ingestion of contaminated food by birds and mammals. Thus ITE was geared to provide immediate and comprehensive research in the wake of the Chernobyl incident in 1986. A national survey was mounted whereby samples of vegetation were collected and analysed and "hot spots" identified. Research on the uptake of radionuclides by sheep was intensified and ITE was able to monitor the changes in radiation hazard with time during and after the fallout phase. This important work is partly supported by DOE and MAFF commissions.

2.4 The BGS is undertaking a geochemical reconnaissance programme in which correlations can be made between rock and soil chemistry and animal health—in particular animal trace element deficiency syndromes. Correlations to human health are more difficult in a developed nation such as the United

Kingdom due to the source variety for our diet and the concentration of population in urban areas (where geochemical data are scarce and often difficult to obtain). The CEC is sponsoring demonstration work in North East Scotland and further, collaborative work with Spanish scientists is planned for medical/geochemical studies in Glasgow and Barcelona. In rural areas where correlations might be attempted, census data in areas of low population are hard to obtain for reasons of confidentiality. For example, the age structure is required in order to normalise the data on human disease. However, such studies are valuable for third world countries and BGS has carried out work on deficiency problems, for example for selenium deficiency in the Caribbean region.

2.5 Background studies of natural radioactivity are also important in terms of human health problems and BGS projects include the investigations of radon emitted from uranium-bearing rocks.

3. Water quality and pollution

3.1 In a country as intensively exploited for industry and agriculture as the United Kingdom, long term research into water quality and the sources, pathways and effects of pollutants is of paramount importance. NERC is actively engaged in aspects of this research inasmuch as water quality affects the plant and animal life of the natural environment.

3.2 The research programmes of the FBA are concerned with aquatic flora and fauna, the inter-relationships between them and the physical, chemical and biological constraints upon them, both natural and man-made. Of relevance to the Committee's enquiry will be research into the incidence of antibiotic resistance in aquatic bacteria. A detailed survey in the Lake District has shown, surprisingly, that the highest resistance is found, not in sewage effluent, but in the waters of remote upland tarns. Mechanisms other than plasmid transfer must be invoked and other possible reasons are being investigated.

3.3 ITE, IH, FBA and BGS are concerned with the transfer of pollutants from the atmosphere and from land into water courses. There are fundamental studies of the sources of potentially toxic materials into groundwater and surface waters, their fluxes through the system and their effects on the flora and fauna. For example, acidification from "acid rain" and other sources such as mining can affect the chemistry of waters through the dissolution of toxic metals in solid and rocks. Aquifers can retain high concentrations of such material for long periods and release it into surface waters where it can become a health hazard, especially during periods of low rainfall. Acid precipitation can also release aluminium from soils into rivers and lakes where it can have a damaging effect on animal life. Acidic flushes, for example from snowmelt, can devastate sensitive aquatic ecosystems and studies of this phenomenon are the subject of ongoing research at IH, FBA and ITE.

3.4 Fertilisers applied to farmland can find their way into surface and groundwaters, presenting problems to wildlife and potable water supplies. Nitrate in waters has been the subject of a recent DOE study and NERC has contributed to the published report based on wide ranging studies at BGS, IH, ITE and FBA. Nutrients in waters in small quantities can benefit the health of the ecosystem, but in excess eutrophication can become a serious problem. This can affect not only the river waters immediately downstream of the source, but can reduce the quality of estuarine and coastal waters.

4. Studies in virology

4.1 The Council supports research into virology spanning natural, marked and genetically manipulated viruses under laboratory and field environments. The IOV is pursuing a number of projects concerned with tick-borne and other naturally occurring viruses that are responsible for the transmission of disease. These include work on arthropod-borne Rift valley fever, tick, gnat and mosquito transmitted viral diseases. Recent research also centres on the development of expression vectors for the production of viral protein with potential for use in diagnostic tests and vaccines, for example for hepatitis B and bluetongue. The Institute's work also embraces risk assessment studies for the development and use of viruses in the control of agricultural and forest pests.

4.2 The recent Special Topic in Biotechnology provides support for studies at institutes and universities in this field.

5. Estuarine and coastal research

5.1 There is evidence that oils from marine fish can be beneficial to human health, particularly with respect to heart disease. Work at IMB is investigating farmed salmonoid fish and in particular the levels of highly unsaturated fatty acids produced from their diet.

5.2 A number of the research projects in animal physiology and biochemistry at MBA are relevant to medical research. Some examples of current and recent work are: mechanisms underlying nerve action potential; biophysical and pharmacological studies on excitable membranes including the effect of general anaesthetics on nerve membranes and local anaesthetics on ion channels; patterns of muscle control by the central nervous system; blood/brain barrier mechanisms for the control and exchange of substances between body fluids and the central nervous system; physiological and biochemical studies on the source

and utilisation of energy in muscular contraction, and intracellular processes associated with growth and development.

5.3 Other areas of research at MBA and IMER relate to the movement and fate of pollutants released into estuarine and coastal waters, notably heavy metals, radioactive materials, hydrocarbon residues and anti-fouling products.

5.4 Much of this important work has been supported by agencies such as the MRC, the Wellcome Foundation, the Muscular Dystrophy Association, the United States National Institute of Health and other medical-related funding bodies.

May 1987

Memorandum by Professor M N Naylor, United Medical and Dental Schools of Guy's and St Thomas's Hospitals, University of London

DENTAL RESEARCH IN RELATION TO CARIES AND PERIODONTAL DISEASES

Introduction

The main areas of dental ill-health from which the general public suffers are dental caries (tooth decay), periodontal disease (gum disease) and malocclusion. Both dental caries and periodontal disease can lead to loss of teeth and the consequent need to provide full or partial prostheses. These may be removable and are described as dentures, or fixed and are known as bridges. The treatment of malocclusion is mainly confined to children though increasingly adults are seeking such treatment. (No attempt is made in this document to assess research needs in relation to malocclusion.)

Most of this work can be carried out by general practitioners working within the National Health Service. However, much of the orthodontic work is carried out by "specialists" and for various reasons a significant proportion of the periodontal treatment which is needed is not provided. Much of the average dental practitioner's time therefore is spent treating dental decay mainly by preparing and filling cavities, and by extractions followed, where appropriate, by provision of dentures.

Although most practitioners carry out simple oral surgical procedures, the vast proportion is carried out within the NHS Hospital Consultant Service.

The main problem areas in dental practice are concerned with the prevention of decay and the prevention and treatment of periodontal disease. The period since the end of World War 2 has seen dramatic advances in the understanding of both diseases but there are still readily indentifiable areas in which further research is essential. These areas of need will now be considered.

Dental Caries

Dental Caries is diet-related bacterial disease. Essentially, inaccessable tooth surfaces are covered by firmly adherant bacterial plaque which comprises a multi microbial colony of organisms bound together by extra cellular polysaccherides, mainly glucans. Amongst these micro organisms are those capable of producing organic acids by the breakdown of dietary carbohydrates, the principal of which is sucrose. The organic acids are capable of reducing the pH at the plaque-enamel interface sufficiently to cause the enamel to be "attacked" and initiate the carious process.

Many other factors are thought to play a part in the initiation of the carious lesion. These include the form in which dietary carbohydrate is available to the plaque, the frequency of intake of sugar-containing foods, the presence of fluoride, possible genetic factors, possible anti-caries factors in the diet and others.

It is now widely accepted that an equilibrium exists at the plaque-tooth surface interface in which demineralisation and remineralisation occurs. Factors which promote demineralisation are cariogenic; factors which promote remineralisation are anti-cariogenic.

Research is necessary further to understand the mechanism of "acid attack" of enamel. Whilst the process clearly involves dissolution, the pattern of enamel change clearly indicates that the process is far more complex. For example, in the "caries attack" the dissolution of calcium salts occurs in the subsurface layers whereas dissolution, in the absence of plaque, caused by, say, a dietary acid (for example lemon juice), the loss is on the surface.

Another area of research which requires further investigation is the mode of action of fluorides. Fluorides ingested systemically in drinking water supplies during the period of tooth development for example age six months to fourteen years, has been shown in many studies, carried out in many areas of the world, to cause life-long reductions in caries experience in excess of 50 per cent. Less dramatic reductions demon-

strated over shorter periods (two to three years) have been shown to occur with topically appointed fluorides, notably in fluoride-containing toothpastes. Understanding of the mechanism of the fluoride effect is far from clear, possible explanations ranging from a simple reduction in the acid solubility of fluoride-incorporated tooth substance to the fluoride inhibition of plaque enzyme systems and role of fluoride as a remineralising agent.

Finally a further area which needs to be researched is the precise reason for the decline in caries prevalence which has occurred over the last decade or so.

Periodontal Disease

Although understanding of the cause and natural history of periodontal disease has increased considerably in recent years, many aspects remain unclear. Hence much further research is required.

Like dental caries, periodontal disease is primarily a bacterial disease. The micro organisms colonising on the tooth surfaces approximating to the gingivae liberate endotoxic substances which cause an inflammatory response in the gingival and periodontal tissues. Clinically this response is chronic in nature and manifests as swollen, blush-red tissues which are generally painless and readily bleed at some stage. Destruction of the attachment to the tooth may take place, and the inflammation spreads into the deeper tissues. Clinically pocket formation occurs. This destructive process may continue at varying speeds, causing the tooth to become loose and in the extreme event exfoliated.

Whilst there is much information available concerning the initial gingival lesion there is little known about factors which control the progression or non-progression of the disease into its destructive phase. This is largely due to two factors. The first is concerned with the difficulty in making accurate and reproducible measurements of the disease status at a particular time. Thus development and validation of reliable and reproducible measurement techniques are essential areas of investigation. Second, chronic progressive disease proceeds at a very slow rate in most cases. Indeed it has been estimated that destruction may progress at a rate as slow as one mm per decade. Therefore clinical studies on human subjects involve the inevitable problems associated with long term investigations.

However there are categories of periodontal disease which progress at very rapid rates. Indeed such can be the rate that most of the supporting bone is lost by the middle of the second decade of life. Further, this rapid destruction may be localised to certain teeth, or more rarely to all teeth.

The pathogenesis and progression of this form of disease is far from clearly understood. Attempts to associate specific micro organisms have been encouraging but much more work is required before treatment can be regarded as entirely rationally based. Undoubtedly there are immunological factors which are involved; these certainly need further extensive investigation.

Treatment of chronic inflammatory periodontal disease is based primarily on the removal of bacterial plaque and hence the reduction of endotoxic substances being absorbed into the periodontal tissues.

This is achieved by improved oral hygiene by the patient and scaling and root planing by the dentist or the hygienist. If successfully achieved, improved plaque control reduces the depth of pockets which behave as zones of plaque accumulation. This is achieved by means of a resolution of inflammation leading to a reduction in oedema. Occasionally, evidence of reattachment is found but this is difficult to predict or to prove. Surgical techniques may be employed to eliminate residual pocketing if more conservative approaches fail.

Adequate removal of plaque is sometimes not possible by the traditional methods of brushing and flossing. In such cases a mouthwash comprising 0.2 per cent chlorhexidine glucanate is extremely useful. This drug effectively prevents plaque growth and its regular use causes major reductions in periodontal inflammation. Whilst chlorhexidine has no serious side effects, it is generally unacceptable except for short term use, because of its very unpleasant taste and unsightly extrinsic staining of teeth. Analogues of chlorhexidine without these undesirable side effects have been compounded but to date none have been sufficiently effective to be regarded as an acceptable substitute. The continued search for an effective anti-plaque agent is necessary.

Summary

Areas of research requiring further investigation.

Dental Caries

(1) Study of the initial "acid attack".

(2) Mode of action of fluorides.

(3) Cause of the decline in caries prevalence.

PERIODONTAL DISEASE

(1) Factors governing the progression of gingivitis to periodontitis.

(2) Factors which govern the rate of progression of periodontitis.

(3) Development and validation of methods of measuring disease levels and disease progression.

(4) Studies of micro organisms in periodontal disease.

(5) Drugs which specifically inhibit plaque formation.

Memorandum by Professor Denis Noble

I write to your committee as an individual but I have relevant experience of medical research and its funding in several capacities. I am leader of a cardiac research team financed primarily by the British Heart Foundation, the Medical Research Council and the Wellcome Trust; Chairman of the Joint Dental Committee of the MRC, SERC and Departments of Health, a past chairman of the Training Awards Panel and a past member of the Systems Board; a founder and a member of the Executive Committee of Save British Science; Foreign Secretary of The Physiological Society; Director of a medical software company (Oxsoft Ltd); and author of a substantial number of recent press articles on research and its funding in the United Kingdom.

I have consulted widely in the organisations referred to above, but this evidence is written in a personal capacity.

(a) *Priorities*

The main way in which the priorities for medical research funded by the MRC reflect the particular needs of the NHS is that representatives of the Departments of Health sit on the appropriate research council committees. This mechanism, in my experience on three major MRC committees and boards, seems to work effectively.

(b) *Balance*

The main problem on the balance of research lies in the fact that the funding of medical research is becoming increasingly reliant on the medical charitable foundations. The success of these foundations is, of course, very welcome, (and, of course, there is coordination between the charities and the MRC) but in the constrained circumstances where the MRC funds have not risen in line with those of the charities, problems arise because areas of research, such as dental research, that are not popular with private donors are hurt twice over. They benefit little from the charities and yet also face the increasing difficulty of funding top MRC projects. This problem would be solved if government funding were to reflect to some degree the increase in private funding. It is also very likely that private funding, by charities and by industries, would increase even more substantially if government support were more generous. Conversations I and my colleagues in Save British Science have had with research directors and others in industry have shown that a major disincentive to further industrial investment in academic research is the fear that the funding will simply fill a gap left by restraint in government funding. Like most people, industrial organisations want to invest in a well-established enterprise from which they and the country will eventually profit.

(c) *New Technology*

So far as new technology is concerned, the main problem is that, with few exceptions—such as computers which have become cheaper, new technology is expensive. This is, I suspect, the main reason why, over a period of nominal level funding, the percentage of alpha projects funded has dropped so alarmingly. There has been an explosive increase in the use of technology in medical research and level funding simply cannot be expected to cope with this without serious curtailing of many research initiatives. It is difficult to arrive at firm figures on this problem, but I would estimate that the funding would have needed to increase by about 5 per cent per annum in real terms over the last ten years to allow for the development of new technology. This estimate is based on my own experience and on that of many colleagues with whom I have had the opportunity to discuss the problem. It also corresponds to the level by which I find that foreign competitors have seen their research budgets increase in real terms over the last decade.

(d) I have referred to this issue in my reply under (b).

(e) *Dissemination*

The main problem in the dissemination of results is that the proliferation of specialist journals, while necessary, has made communication across the boundaries more difficult. To some extent this tendency has been counteracted by the Trends type publications. It might, though, be worth

encouraging authors of papers that have implication for other fields to consider using the non-specialist journals for some of their work.

(f) *Duplication*

I am not convinced that this is a major problem. Many of the advances in my own field have come from young researchers starting off by repeating the work of others. In this process they have developed a new line because they have looked at the problems with new eyes. It is difficult therefore to know when duplication is strictly unnecessary. Over the long-term, no research group is viable if it merely duplicates the work of others, so there is a strong tendency against mere duplication already built into the system.

(g) *Patient care*

In my own field of heart research I think it is clear that the advances are having major impact on patient care. The success of the British Heart Foundation is evidence enough of the way in which private donors perceive the benefits. More specifically, in my own area of cellular electrophysiology, there has been a major development in the last 10 years to apply the results and methods of basic research on normal cardiac rhythm to the problems of understanding cardiac arrhythmia. The results are impressive enough for us to say that the cellular mechanisms of certain types of arrhythmia are now known in considerable detail. The fact that this has taken a decade is no surprise. It is likely to be another decade or two before the insight gained leads to better treatment.

(h) *Training*

Medical research has become a strongly interdisciplinary activity. Many of the most productive researchers did not orginally do degrees in medical science. Yet we are now finding it virtually impossible to fund the transfer of graduates from, say, chemistry, physics or engineering. At one time, it was sufficient to allow such graduates to embark immediately on PhD research on a studentship. They would pick up the relevant medical science training on the way. I now think that this has become too heavy a burden for most people and my own preferred solution is to suggest that a graduate should do one or two years of the relevant medical science degree before embarking on full time research. Of course, the outstanding people do not need this, but others, even the very good, do.

A related problem lies in the serious cutbacks in research studentships and in intercalated science degree courses for medical students. These problems are, in part, responsible for the loss of potential good medical researchers. They could be solved with relatively small sums of money.

It is sometimes argued, I think by Government departments, that it is not the role of the Research Councils to fund undergraduate work. But when that is the only way to attract future researchers into the field, that argument is weak. Everyone I have spoken to with the relevant experience, including my former colleagues on the MRC Training Awards Panel, agrees that this is a matter of extreme importance to the future supply of top quality researchers.

(i) *Organisation*

So far as organisation is concerned, it seems to me that the setting up of the Joint Dental Committee is an important experiment in trying to bring the funding of one area of medical research, funded by several different Government bodies, under one umbrella. It may be too early to judge the success of this experiment but it is not too early to point out some advantages and disadvantages. The main advantages are: (a) that experience from fields as widely diverse as materials science and biochemistry is brought to bear on the review of research proposals; (b) that an overall view is developed of progress and funding in the area. The main disadvantage is that it could be argued that too much power lies in the hands of one committee rather than several.

My own view is that the advantages have been minimised and the disadvantage maximised by the severe restraint on funding. The development of an overall view should, ideally, lead to such a body taking the initiative in trying to encourage proposals in areas that it thinks are ripe for development, and it has had special meetings devoted to that end. This role though is difficult to play at a time when as few as one-in-ten project grants are funded. For similar reasons, people in the field are more anxious than they would otherwise be about the concentration of power. I therefore believe that this major initiative by the research councils and departments of health has suffered from being launched at a time of extreme difficulty in funding top quality (alpha) research.

General remarks on research careers and contracts

Finally, the Committee says that it welcomes other evidence related to their terms of reference. Here, I think it is worth drawing your Committee's attention to the report and appendices prepared by Save British Science for your Committee's enquiry into Civil R&D (1st Report 1986–87). Much of that evidence related to medical research, and in the year since the report was prepared nothing has changed the situation, which remains as fragile and demoralising as it was.

The two major problems are that facilities are often inadequate by international standards and that short-term contracts for one or two years on research grants are a poor basis for a career. I recently compared the British and North American research grant proposals I had received for refereeing over a three month period. The seven British proposals I received were for an average of £21,000 per annum for an average of 2.4 years, while the three North American proposals were for an average of £128,000 per annum over an average period of four years. There are, of course, differences between North American and British funding. But even if one allows, generously, for a factor of two in favour of Britain by virtue of the dual-support system, these figures (which I am sure from conversations with many others are typical) imply that British medical researchers must apply to at least three bodies simultaneously to arrive at comparable funding and, most importantly, they must do so twice as frequently. This is not the way to get best value for money from a long-term point of view since short-term contracts are unattractive to the best people and the research aims must be geared to short-term needs for immediate results rather than the long-term needs of the research field itself.

I would therefore strongly urge the introduction of rolling grants and contracts based in part on the programme grant concept. A possible system would be to award contracts on programme-type grants that roll on a five year basis, as at present, but with a 1–2 year cut-off period if the grant is not renewed. That would allow established researchers four years before they must start seeking renewal of their funding (assuming that they do this one year before the rolling five year period ends) and, if they fail, they would have 1–2 years of contract to finalise their work on the project, see everything through to publication and to seek alternative employment. If such grants were available at about three times the number of current programme grants (which have been heavily cut back recently), we would approach more closely the best of the North American system and return to the best tradition of British Science which was once renowned for its long-term perspectives and achievement.

Of course, the research councils would need more secure funding over the long-term to enable such proposals to be considered and that requires the formulation of a long-term policy on science and its funding. Medical research would benefit from this as much as any other field of science.

Letter from Professor D Noble

Further to my evidence submitted to your Committee considering medical research, I now have the latest figures on the level of funding of grants considered by the Joint Dental Committee, of which I am Chairman, and to which I made reference in my evidence.

So far this year, we have been able to fund only six out of 33 applications. At our last meeting, the Committee was particularly impressed with the quality of the applications and, even at the highly competitive level of the last year or so, felt that five warranted funding. For the first time, one of our parent bodies (the MRC) has been forced to reduce our recommendations. Only two are now likely to be funded.

My comment in my written evidence that this exciting venture in inter-research Council and Health departments cooperation is being put at risk by the poor level of funding is fully borne out by events since I wrote my evidence.

July 1987

Memorandum by North East Thames Regional Health Authority

Involvement in Medical Research

1. This Region is involved in the funding of medical research through its Locally Organised Research Scheme (LORS). There is a Regional Research Committee (Constitution and Terms of Reference attached—Appendix A) which advises the Authority on the conduct of LORS and on research matters generally. A list of projects supported under the North East Thames Regional Health Authority (NETRHA) LORS in the financial year 1986–87 is attached (Appendix B). Decisions on the funding of medical research through LORS are based on the scientific merit of individual proposals falling within the general aims of the scheme. The Notes of Guidance for locally organised Research Grants (Appendix C) outline the aims of the scheme and its approach to funding is outlined in Appendix D.

2. NETRHA has a Centre for the Study of Primary Care, funded by the RHA and based at a Health Centre in East London. This research unit, with its joint aims of research, training and development in primary care, was funded initially for three years from April 1983. Funding has been extended for a further two years to April 1988. Evidence from the Centre for the Study of Primary Care relevant to the deliberations of the Sub-Committee is attached as Appendix E.

3. A Register of Current Research Projects on Mental Health Services in the North East Thames and other Regions has been compiled and recently updated (February 1987). The title page, list of research projects and index of funding bodies for these projects is attached as Appendix F.

4. There are a substantial number of academic departments in the Region (for example Community Medicine, Epidemiology General Practice, Medical Geography) carrying out epidemiological and related research. However, the approach to research in this Region is not yet sufficiently structured. There needs to be a formulated view of future research programmes and priorities with more collaboration between departments and disciplines.

5. NETRHA will be more closely involved in determining priorities in medical research through its appointment of a Director of Health Care Policy/Regional Medical Officer. This post was filled a year ago and combines the traditional role of Regional Medical Officer with a new concept of heading a unit for assessing the health care needs of the Region, for instance the balance between the preventative and curative services to be provided. It is intended that the Director of Health Care Policy will head a group of multi-disciplinary teams, researching epidemiological and social factors, evaluating developments in all aspects of health care, and assessing the impact of local policies on the health care of the population. The outline job description for this post is attached (Appendix G).

6. There is a Regional Research and Development Strategy in existence, which was published in the Regional Strategy for 1984–93 (the relevant section of the Regional Strategy, pages 211–220, is attached as Appendix H). However, the research strategy for NETRHA is to be revised and refined in the near future by the Director of Health Care Policy.

7. It is also intended that in the future the Regional Research Committee and LORS should be more closely integrated with the research and development strategy of the Region. The appointment of the Director of Health Care Policy, and the recruitment of the necessary support staff, should lead to an improvement in this Region's overall strategy in research, based on the assessment of health care needs of the local population, and should also provide an opportunity for closer integration with the Regional Research Committee.

8. The Sub-Committee's enquiries have come at a time when the NETRHA was beginning to review its own priorities in medical research. The following evidence represents an interim view based on discussions with some of the relevant people in this Region, including several medical members (past and present) of the Medical Research Council's Health Services Research Panel.

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

1. At the moment, priorities for medical research are set mainly by researchers and by academic departments. Priorities in the funding of medical research are determined largely by the quality of the proposals put forward. People with high quality research potential often choose to go into particular branches of medicine with an emphasis on biomedical and scientific research, rather than in the direction of community care, geriatrics, psychiatry, primary health care etc. The specialities which cover these services often do not attract the types of people who are particularly interested in research. This mismatch between kinds of people and different research subjects is a fundamental problem, which currently leads to a relative overproduction of what is generally termed health services research, particularly by contrast with biomedical and scientific research. If priorities in medical research are to reflect more closely the needs of the NHS and the general health needs of the nation, a large responsibility lies with the Deans of medical schools. There also need to be centres of excellence dealing with priority areas, which would attract high calibre people and where researchers could be trained. It may be possible to fund studentships to develop a core of well trained people in priority areas.

2. From a management point of view, NETRHA would like to push research in the direction of being more directly useful to the NHS. That would be possible, although a radical change in approach, in the field of applied research. It would however, be very difficult to set priorities for basic scientific and medical research based on general health needs; basic research cannot really be designed to be directly useful, and in any case people involved in basic research are often studying a topic for academic reasons and as an extension of a personal field of interest.

3. A more structured approach to research, with the Regional Health Authority taking a proactive role, would probably help to determine priorities which reflect more generally the needs of the NHS and the health needs of the nation. There is no reason why Health Authorities could not identify questions to which they need answers, determine if these questions are researchable, prepare an outline description of the problem and then go to research departments for tender. Tenders could be invited from research departments with a known interest in the field in question, so that there would be opportunities for merging individual research interests with more general service needs. Regional Health Authorities could perhaps help to establish one or two centres in each Region to work specifically in health services research. If this was carefully planned, in association with medical schools and academic departments, it could provide an

environment with both skills and opportunities in priority areas. It would also offer an opportunity for trainees in community medicine and in clinical specialities to develop necessary multi-disciplinary skills.

4. A major problem in the United Kingdom, is trying to meet the expanded and expanding health needs of the nation within the limited resources of the NHS. Priority should therefore be given to evaluating what is currently happening so that resources within the NHS can be effectively redistributed. Such evaluation studies would have to be multi-disciplinary. The RHA may decide to take a lead in identifying the priority areas.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

1. It is generally accepted that at the moment too few resources go into researching the health needs of this Region. There is a particular dearth of research in service delivery, primary care/hospital interface and the professions allied to medicine. For many years research proposals of a service oriented nature submitted to LORS were considered by the Regional Research Committee under a miscellaneous category. As Appendix D shows, the current apportionment of research funds now includes one seventh for health services research. The calibre of research proposals submitted in the field of health services research is gradually improving. However, although far more of the LORS funds go into basic research, the feeling of the Regional Research Committee is that the quality of health services research proposals received does not warrant a further redistribution of research funds at the present time.

2. It would be very difficult to legislate for balance in research. To a large extent research funds have to follow the people who are experienced in research. It is vital that resourcing agencies only fund research of high scientific quality and merit; this obviously has a weeding out effect which currently affects health service research. Many people in professions allied to medicine are building up research interests and good ideas in priority areas (for example rehabilitation), but these people do not have the same tradition of research as the medical profession and have usually had limited exposure to research methodology in their training. Receiving adequate support in preparing research proposals and obtaining funding is often a problem for such people, yet their interests are in priority areas.

It would perhaps be possible to earmark growth funds for particular priorities, but there is no case for cutting back on research of the highest quality just because it is in the "wrong" subject. To avoid an increase in research of a lower standard, it would be more appropriate to provide additional funds for setting up research training and research appreciation programmes for priority fields in order to provide a stimulating environment and generate high calibre research.

3. There are many high calibre people working for postgraduate qualifications for which they have to do research. Currently, research funds tend to flow in that direction with little left over for other areas. Research for higher degrees is generally too circumscribed to address major health issues requiring a multi-disciplinary approach. As a result, medical research tends to be heavily hospital dominated, asking questions to which the answers are unlikely to affect greatly the broader "economics" of health care. For example, not enough research is aimed towards primary care, often because it is thought that morbidity is difficult to measure. More thought needs to be given to identifying areas of prevention and primary care which could ease the burden on secondary care. Any relevant research tends to occur *ad hoc* at the moment, rather than as part of a planned research framework. Again, this problem will be addressed in the development of NETRHA's research policy.

4. There is an argument for providing a separate budget for commissioned health services research; the RHA, for example, needs much more sound research on which to base policy decisions. Some of this research could not really be classified as medical research; it is more operational research, which should be part of the everyday management of a health authority. Under the general heading of health services research it would be difficult to draw the line between medical and operational research. It would probably be a mistake to have operational research competing for existing medical research funds, particularly in the current financial climate. For example, whilst LORS funds have been increased each year in line with the Government's level of inflation, this does not reflect the real level of inflation in the medical field so therefore the sums of money to be dispensed for research have a progressively falling purchasing power. In order to allow expansion in relevant health services research, an additional budget is really required. It would probably not be appropriate for such funds to be administered by the existing Regional Research Committee, although cross-representation would be essential.

5. In medical research, careful thought needs to be given to the balance between research in several different areas:

(i) research into common disorders, such as stroke;

(ii) research into rarer disorders (which are just as important to those patients who suffer from them as more common disorders and for which cures might be found);

(iii) research into new and serious conditions such as AIDS.

Research based totally on common disorders would be misguided. It may seem appropriate to cut back programmes related to relatively rare diseases, but researchers in those fields tend to be able to see their way forward to producing major benefits to patients and it would be wrong to stop research in those areas. To a certain extent priorities have to be based on "the art of the possible". It may be possible to find a cure through research for a rare disorder, whilst a common disorder may never be cured however much money is poured into research in that area. Also, research into uncommon disorders can often elucidate mechanisms in common disorders which are themselves less easy to work with. It would also be wrong to support "poor science" just because a proposal relates to research on a common or expanding disease or illness.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

1. Priorities are changing in some areas, but probably not sufficiently in broad terms. For example, AIDS has become a research priority but it is not clear whether all AIDS research is of high quality. It would be a mistake for research priorities to be too "fashionable"; rather than funding lower quality research because the topic happens to be in the public eye, it would be better to use the money elsewhere where it might make a greater contribution to health and medical care.

2. It is doubtful whether priorities in medical research are adapting to changing population structures. The Rothschild approach to commissioning research could be used in this area, but there is a strong school of thought that this approach would not be wholly appropriate. It is recognised that the best research is done by those researchers with a burning desire to do research in their subject area, and such people can often achieve much more with less money—it would not be economical to pour money into particular areas if this burning desire is not present or cannot be generated amongst researchers. However, waiting for people to want to do research in "unpopular" areas that need attention would also be inappropriate. The earlier points about training and centres of excellence ((a) 1. and (a) 3.) are relevant here.

3. Priorities in medical research probably do adapt well to new technology. Researchers are very much involved with new technology and firms producing new technology are often happy to give free samples to researchers. Given the equipment and access to research funds, clinical researchers can often think of many useful applications (for example the experience with the use of lasers in the NHS). The interaction between clinical research and new technology can be exciting and fast moving and is attractive to both imaginative medical researchers and more diligent logical researchers.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

1. Institutions generally receive more proposals than they can fund. In most cases the selection of research studies for funding is based more on the quality of proposals than on specific priorities. However, medical charities will tend to support applied research in their own field of disease interest, whereas other funding agencies will tend to be more science led. The availability of charitable funds therefore does influence what research is done. For example, considerable funds are available annually for cancer research but the effort going into cancer research is probably disproportionate to the results coming out. It is probable that there are different thresholds for quality of research proposals depending on the funds available. Some areas of human suffering are under-represented in research because no specific funds are earmarked for those problems, whilst other areas (for example cancer research and muscular dystrophy research) receive funds out of proportion to their impact on the population. There is probably a case for public funding making more effort to maintain the balance between research priorities.

2. At the moment priorities for Regional funds are not sufficiently influenced by Regional and District needs. Most Research Councils and private foundations have their own restrictions which may be specific and not NHS related. The need for a separate Regional research budget for health services research as discussed under (b) 4. is relevant here.

(e) *Are the results of research adequately disseminated?*

1. In one sense research results are disseminated to excess and the volume of publications makes it difficult for people to keep up to date, even in their own field. These days medical staff can only expect to be au fait with research results in a very narrow area. It is also possible for researchers to spend too much time reviewing literature at the expense of actually doing research. This situation would be helped if editors of journals operated more strict controls over their publications.

2. On the other hand, research results are often not effectively disseminated or followed up by implementation. The actual reading and taking notice of papers published in journals tends to be inadequate amongst NHS practitioners. Clear findings are repeated over and over again in applied research, yet the

findings are not implemented. There must be an extra way to disseminate findings so that changes in actual practice take place. (This will be discussed further under (i)).

(f) *How is unnecessary duplication of research effort avoided?*

1. Funding bodies usually try to ensure that research effort is not duplicated by cross representation in committee membership. In NETRHA, the chairman of the Regional Research Committee also chairs all the Sub-Committees and is a member of several other research committees including that of the special trustees of one of the teaching hospitals in the Region. The Regional Research Committee also includes a member of the Medical Research Council, whose input to the avoidance of duplication of research effort is invaluable.

2. Research funding organisations need to review each others research portfolios on a regular basis.

3. Researchers should carry out an adequate review of the relevant literature before embarking on their research. However, the volume of research and literature is such that it is not always possible to avoid some unnecessary duplication. It is probable that more should be done to avoid duplication, but the gaps in research effort are far more worrying than the amount of duplication.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

1. Changes relating to advances in new technology are often quickly implemented at the end of the research stage, particularly when the main requirement is a new piece of equipment which can be bought with "soft" money.

2. With basic research there is often a very long lead time before the results can be exploited. The speed with which improvements take place often reflects the difficulties which have to be overcome during the exploitation process, especially if the potential market is relatively small. However, if research results are really good—and widely acceptable—word gets around rapidly.

3. Research findings relating to organisational advances tend to be taken up much less readily. There is a great deal of research evidence for changes in patterns of care, but some professionals will not implement change even when the evidence is available. This may be due partially to inertia in the management of change, but it is a very difficult area to tackle. There are some problem areas with emotional overtones, so that unpopular findings can provoke emotional reactions which have nothing to do with the quality of the research.

4. Apart from resistance to change, there are some areas in which medical research is too far ahead of resource allocation for changes to be implemented. In such cases there may be grounds for additional funds to be made available to smooth the implementation of results.

5. Far too little effort currently goes into implementing and evaluating the results of research. For researchers the "next" project is often what matters most. On the whole, medical researchers are not obliged to specify in their grant applications, ways in which their research could lead to actual improvements in patient care or health education, nor is any follow-up routinely undertaken to check whether actual improvements have taken place. Too few resources are put into following up and evaluating research results in the NHS field situation. Perhaps a committment to action based on unequivocal research results should be an integral component of an applied research proposal—for example, approval (as from an ethics committee) could be sought from those whose working practices should possibly change as a result of the research.

(h) *What changes in priorities in the training of medical researchers are needed?*

1. It is essential that clinical training programmes take proper notice of the need to train clinical researchers (this is being considered currently in another forum).

2. It is important to train those researchers interested in biomedical problems in the skills of evaluation, so that they address the correct questions and know where to go for advice. There is also a feeling that the knowledge and understanding of statistical techniques leaves a great deal to be desired, even amongst very good medical researchers.

3. There is a great need for formal and continuing education training in health services research by collaboration between NHS and academic departments. A better understanding of the methodology of health services research is needed and there should be improvements in the training of medical researchers in applied health services research. A common problem is the existence of an important question but no appropriate methodology to answer it. New methods are urgently needed for instance in the evaluation of planned change and these are more likely to be developed in good departments of health services research.

4. There should also be more opportunities for the training and development of non-medical clinical researchers. There is an enormous reservoir of very valuable people with a real understanding of research issues, but they need foci and training modules.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

1. There need to be better methods of looking after good researchers. There is currently no stability for people wishing to take up a career in research. University departments are under increasing financial pressure and university staff are having to spend more time on administration, NHS commitments and teaching at the expense of research. Centres of excellence and expertise are under attack, when what is good should really be preserved. It takes a long time to build up a good team, but a core of highly experienced researchers working together can create a very dynamic environment for producing excellent work in the national interest. The Medical Research Council has had to cut back the amount of new research it can fund because of the need to fund pay increases to university staff out of its general research allocation. Young enthusiastic doctors or scientists find the odds stacked against them and whilst they may attract a short-term grant for three years, they soon have to start worrying about where their next funds will come from. This perceived lack of future in a research career is not good for medical research in the long term.

2. There is no doubt that more population based research is required. A careful look needs to be taken at how NHS money is currently spent and how services should be improved. It may be possible to "top slice" research funds to look at how services are currently provided, but on the other hand medical research is probably already underfunded. It would be difficult and probably unjustified to utilise existing medical research funds for more operational research which should be done as part of the proper running of the NHS. Health authorities need to be more proactive in deciding their research priorities. It may be possible to get commercial organisations to fund more medical and health services research if this avenue were explored more seriously. However, it is likely that Health authorities will need to allocate resources themselves to research, commission research studies, implement the results (or experiment with them) and evaluate the outcome in terms of services or patient care. This would be subject to the criticism that the money would have to come from patient services with a resulting reduction in the level of service. However, with good research design and careful implementation of the findings an improved service might be provided at reduced expenditure.

3. Biomedical research often does not include an evaluation component and there is usually no collaboration with an epidemiologist. All major research proposals should have a built-in evaluation component in relation to the contribution of the research to the health services. Perhaps funding bodies could routinely address this by insisting that proposals have received "evaluation component approval" (from a panel of epidemiologists, economists etc.) in the way that ethics approval must have been obtained.

4. The application and implementation of research findings also needs to be addressed. One suggestion was made under (g) 5. Perhaps it would also be possible to link resource allocation in the NHS in some way to the application of relevant research findings. It would be very difficult to impose sanctions against, for example, those places which do not carry out day surgery or have not changed their varicose vein surgical methods in the light of research findings. However, with the development of performance indicators and the review system in NHS management, some steps to improve the application of research may be possible.

5. There should be clear Regional and District research priorities set out with appropriate time-scales and included in the annual review. Basic research should be the responsibility of specific funding bodies and health services research should be funded through separate channels. There would need to be strong links with academic departments of community medicine for health services research.

6. The identification of relevant research projects and the application of research findings cuts across General Management as it now exists in the NHS. In this sphere, the managerial/professional relationships within health authorities are very important—how the medical advisory machinery relates to General Management is a crucial issue. If responsibility is placed on the professional advisory machinery to advise the General Manager on the implementation of research results and therefore change (stopping things as well as introducing new methods), it could be seen as a dereliction of professional duty if the issue is not properly addressed.

OTHER EVIDENCE RELATED TO THE SUB-COMMITTEE'S TERMS OF REFERENCE

1. Before buying equipment, it is possible for NHS staff to consult a DHSS "evaluation of instrumentation". Would it be possible to produce something similar for specific areas of medical research—easy and quick to read, with up to date information on research results relevant to day to day practice?

2. One model for research funding might be for:

(i) District Health Authorities to fund relatively short-term applied research work, on the principle that activities with short-term benefits should be financed by the parties that stand to gain from

them. A key element would be the ability to deliver a service that is as good or better but in a more economic way.

(ii) Regional Health Authorities to fund medium to long-term applied research and some strategic research with wider application.

(iii) DHSS to fund long term strategic research which would benefit the whole country in the longer term.

(iv) LORS funds to be used, as now, for the encouragement of high quality research by high calibre people relatively new to research.

(v) The Medical Research Council to support and develop centres of excellence and expertise in their chosen priority areas.

3. A model for the organisation of research might be:

(i) Academic units, supported by general university funds, providing the basic "floor" of research capability enabling speculative ideas to be generated and developed to a stage at which specific funding can be sought. (This concept is discussed in HL 20–21, 3.13).

(ii) The addition of high quality research capacity to these academic units once funding has been attracted from the Medical Research Council or other external sources, including charitable trusts.

(iii) Applied research could be commissioned by Health Authorities from research units with known interests and expertise in the field in question. Medical or health services research could then be extended, at possibly marginal cost, to produce direct benefit to the NHS in general. At this stage, closer working relationships with service colleagues could be expected, with a consequent increase in understanding of service and research activities on both sides, a greater chance of medical research being directly relevant to the NHS and a greater chance of research results being implemented because of the involvement of day to day practitioners in the research process.

(iv) Research units specialising in major areas of concern for the NHS in general, if their work is or could be of demonstrably practical benefit, would tend to attract more and more commissions and more high calibre research staff, thereby increasing their research capacity, capability, expertise and usefulness to the NHS.

4. Before either of these models could be effectively implemented, health authorities would need to learn how to define their research requirements. This is probably a role for community physicians and should therefore form a strong component of their training so that they can advise their authorities when commissioning research.

Science and Technology Committee Civil R&D, 1st Report, 1986–87, HL 20

A number of the problems identified in this previous report apply in the field of medical research. Excluding those sections relating specifically to Defence, there are a number of points where a slight change in terminology would describe problems in the field of medical research. Points of particular relevance are those relating to the need for:

Evaluation (for example 5.37, 6.116).

Balance between academic freedom and selectivity (for example 6.19).

Explicit mechanisms for funding basic, applied and strategic research (for example 6.47–6.67).

Protecting the amount of research by itemising ancillary costs separately (for example 6.56).

Motivating research in exploitable areas and exploiting to the full results of research (for example 6.68–6.79).

Increased appreciation of the value of R&D amongst management (for example 6.91–6.93—the role of medical officers on management boards is important here).

Increased collaboration between universities and industry (for example 6.102–3—in NHS terms the links would be between academic departments and health authorities).

This report is being studied further as part of NETRHA's development of a Regional Research Policy.

April 1987

Appendices

A. Regional Research Committee—Constitution and Terms of Reference

B. NETRHA—Projects supported under the North East Thames Regional Health Authority Locally Organised Research Scheme in the Financial Year 1986–87

C. NETRHA—Notes of Guidance for Locally Organised Research Grants

D. Apportionment of Regional Research Funds

E. Centre for the Study of Primary Care—Evidence for the Sub-Committee

F. NETRHA—A Regional Research and Development Strategy

Appendix A

Regional Research Committee

Constitution (19 members)

6	medical members selected by the RHA to represent the 12 non-teaching Districts for four years, in rotation.
5	medical members—one nominated by each of the Teaching Hospitals/Medical Schools in the Region (St. Bartholomew's, The London, University College, Royal Free, The Middlesex).
1	dental member—to be nominated by The London and University College Dental Schools.
1	member to represent community medicine interest—nominated by the Regional Medical Officer.
1	member representing nursing interests—nominated by the Regional Nursing Officer.
1	member nominated by the Regional Paramedical Committee.
1	member representing General Practice—nominated by the Regional Coordinating Committee (the coordinating committee of Local Medical Committees in the North East Thames Region).
1	pharmaceutical member to be nominated by the two London University Pharmacy Schools.
1	member nominated by the Medical Research Council.
1	lay member—nominated by the RHA.

Terms of Reference

1. To advise the Authority
   i) generally on research matters including ethical considerations.
   ii) on the conduct of the Locally Organised Research Scheme—specifically on projects submitted for support from the RHA's allocation for the scheme.
2. To arrange for guidance and assistance to be given to less experienced applicants in the formation of their projects.

Appendix B

NORTH EAST THAMES REGIONAL HEALTH AUTHORITY

Projects Supported Under the North East Thames Regional Health Authority Locally Organised Research Scheme in the Financial Year 1986–87

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
Barking, Havering & Brentwood H A			
Oldchurch Hospital	Dr W R Burnham Project duration—2 years from 1.4.85 Completion Date: 31.3.87	Development of a computer assisted method of dietary assessment.	
		Salary	6,991
		Expenses	400
		Equipment	
		Total	7,391
Basildon & Thurrock H A			
*St. Andrew's Hospital	Dr M Eve Project duration $2\frac{1}{2}$ years from 1.4.86	Fibronectrin levels and white cell competence following burn injury.	
		Salary	6,876
		Expenses	3,000
		Equipment	2,990
		Total	12,866

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
Bloomsbury H A			
1. The Middlesex	Dr C G D Brook & Professor H S Jacobs Project duration 2 years from 1.4.85 Completion Date: 31.3.87	The role of biologically active luteinising hormone (LH) in the control of human puberty.	
		Salary	9,131
		Expenses	1,500
		Equipment	1,000
		Total	11,631
2. U C H	Professor C G Clark Project duration 3 years from 1.4.84 Completion Date: 31.3.87	Faecal bile acid profile to detect early colorectal cancer.	
		Salary	9,180
		Expenses	1,850
		Equipment	400
		Total	11,430
3. *The Middlesex	Professor R K Craig & Professor J Pattison Project duration 2 years from 1.4.86	Development of DNA probes as diagnostic reagents for infectious diseases.	
		Salary	
		Expenses	15,000
		Equipment	
		Total	15,000
4. *The Middlesex	Dr Mary Forsling & Professor H S Jacobs Project duration 2 years from 1.4.86	Neuroendocrinology of the Premenstrual Syndrome.	
		Salary	8,492
		Expenses	
		Equipment	2,400
		Total	10,892
5. U C H	Dr M R Hetzel Project duration 2 years from 1.4.85 Completion Date: 30.4.87	Interstitial therapy with the Neodymium YAG laser in bronchial tumours.	
		Salary	14,358
		Expenses	1,000
		Equipment	
		Total	15,358
6. U C H	Professor P G Issacson Project duration 3 years from 1.4.84—late start Completion Date: 31.8.87	Immunohistochemical characterisation of Large cell and Extranodal lymphomas.	
		Salary	9,492
		Expenses	1,262
		Equipment	
		Total	10,754
7. *U C H	Dr D A Isenberg Project duration 2 years from 1.4.86	A study of the use of low fat diet therapy to control systemic LUPU erythematosus	
		Salary	6,196
		Expenses	300
		Equipment	
		Total	6,496
8. *The Middlesex	Dr A Kurtz Project duration 3 years from 1.4.86	Prospective longitudinal study of a cohort of diabetic patients with minimal albuminuria offered intensive care	
		Salary	7,984
		Expenses	
		Equipment	
		Total	7,984

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
9. U C H	Dr M Marshall Project duration 3 years from 1.4.84 Completion Date: 31.3.87	To exploit thyroid cells in long term culture as a routine clinical bioassay for thyroid stimulating antibodies.	
		Salary	9,223
		Expenses	2,200
		Equipment	
		Total	11,423
10. U C H	Dr A Norden & Professor F Flynn Project duration 3 years from 1.7.84 Completion Date: 30.6.87	The aetiology of renal impairment in patients with Bence-Jones proteinuria and as a possible approach to its prevention.	
		Salary	6,953
		Expenses	870
		Equipment	
		Total	7,823
11. *U C H	Professor D Picton Project duration 2 years from 1.4.86	Distortion of teeth following insertion of adhesive composite fillings and fissure sealing marginal defects of restorations.	
		Salary	9,951
		Expenses	1,167
		Equipment	
		Total	11,118
12. *G P Unit U C H	Dr J N Rea Project duration 2 years from 1.4.86	A study of the appropriateness of discharge from hospital and its effects on patients and their use of community and acute services.	
		Salary	14,053
		Expenses	300
		Equipment	300
		Total	14,653
13. *The Middlesex	Dr J Rode & Dr L Hiroschowitz Project duration 2 years from 1.4.86	Quantitation of neuroendocrine and ganglion cells in the lamina propria and identification of their secretory products in both normal and irradiated bowel.	
		Salary	9,659
		Expenses	3,400
		Equipment	
		Total	13,059
14. *The Middlesex	Dr R D Speller & Dr D Richards Project duration 2 years from 1.4.86	Real time tissue characteristics using a dual-energy X-ray probe.	
		Salary	12,737
		Expenses	
		Equipment	2,970
		Total	15,707
15. U C H	Mr T F Watson Project duration 2 years from 1.4.85 Completion Date: 31.3.87	A new look at the effects of cavity preparation on teeth.	
		Salary	
		Expenses	220
		Equipment	
		Total	220

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
The City & Hackney H A			
1. St. Bartholomew's	Professor G M Besser Project duration 3 years from 1.4.84 Completion Date: 31.10.87	Clinical studies with the two new hypothalmic regulatory peptides CRF-41 & GRF-40.	
		Salary	7,236
		Expenses	3,500
		Equipment	
		Total	10,736
2. *St. Bartholomew's	Professor A W Clare Project duration 3 years from 1.4.86	Prevalance of problem drinking and the intervention in a medical outpatient and casualty attender population.	
		Salary	12,651
		Expenses	
		Equipment	
		Total	12,651
3. *St. Bartholomew's	Dr R J Davies Project duration 3 years from 1.4.86 (Project funded in part only)	Changes in mediator levels, cellular composition of nasal secretions and nasal mucosal mast cells induced by allergen and the influence of therapy.	
		Salary	
		Expenses	2,762
		Equipment	
		Total	2,762
4. St. Bartholomew's	Dr E Gale Project duration 3 years from 1.4.85 Completion Date: 31.3.88	Early complications and endogenous reserve in diabetic probands recruited in the course of a family study.	
		Salary	9,812
		Expenses	
		Equipment	
		Total	9,812
5. *C & H District Offices	Miss P Hibbs Project duration 2 years from 1.4.86	Evaluation of the pilot study of community antenatal care the aim of which is to implement a schematic approach to prenatal care in one health centre as a model for the district.	
		Salary	10,921
		Expenses	
		Equipment	
		Total	10,921
6. *St. Bartholomew's	Dr P J Kumar Project duration 3 years from 1.4.86	Studies on the Aetiopathogenesis of Coeliac Disease.	
		Salary	9,338
		Expenses	2,000
		Equipment	
		Total	11,338
7. St. Bartholomew's	Dr D F J Mason Project duration 3 years from 1.4.85 Completion Date: 31.3.88	The role of natural opiods in ganglionic transmission.	
		Salary	16,016
		Expenses	701
		Equipment	
		Total	16,717

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
8. St. Bartholomew's	Professor L Rees Project duration 3 years 1.4.84 Completion Date: 31.3.87	Circulating endogenous opiates: further characterisation.	
		Salary	14,412
		Expenses	1,000
		Equipment	
		Total	15,412
9. St. Marks Hospital	Dr C Rodrigues Project duration 2 years from 1.4.85 Completion Date: 31.3.87	Maintenance of fluid electrolyte & nutritional balance after extensive small bowel resection.	
		Salary	
		Expenses	15,000
		Equipment	
		Total	15,000
10. *Department of General Practice & Primary Care, Medical Colleges of Bart's and London	Dr L J Southgate Project duration 3 years from 1.4.86	Patient characteristics and microbiological outcomes in women with vaginal discharge.	
		Salary	8,387
		Expenses	5,000
		Equipment	600
		Total	13,987
Hampstead H A			
1. *Royal Free	Professor D N Baron Project duration 2 years from 1.4.86	Ion transport in the hyponatraemia of the sickle-cell syndrome and hypoalbuminaemia.	
		Salary	12,533
		Expenses	2,000
		Equipment	
		Total	14,533
2. *Royal Free/Friern	Dr P G Campbell Project duration 1 year from 1.4.86	Psychopathology and social impairment in patients with schizophrenia from an inner city metropolitan borough.	
		Salary	12,998
		Expenses	100
		Equipment	
		Total	13,098
3. The Royal Free	Dr S W Clarke Project duration 3 years from 1.4.84 Completion Date: 31.3.87	Regional deposition of Inhaled Particles in the human lung.	
		Salary	9,573
		Expenses	
		Equipment	
		Total	9,573
4. The Royal Free	Dr Burroughs Project duration 2 years from 1.4.86	Correction of primary haemostatic defects by de amino 8 D arginine vasopressin (DDAVP) in Cirrhosis. Clinical use and laboratory correlations.	
		Salary	
		Expenses	4,651
		Equipment	
		Total	4,651
5. *The Royal Free	Dr J Crow Project duration 2 years from 1.4.86	The role of mast cells in gynaecological pathology.	
		Salary	4,414
		Expenses	300
		Equipment	
		Total	4,714

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
6. *The Royal Free	Mrs M W Dobbs & Mrs R McClenahan Project duration 1 month from 1.6.86	Survey of the detection and response to dysphonia by the public and general practitioners.	
		Salary	823
		Expenses	
		Equipment	77
		Total	900
7. *The Royal Free	Mr G Evans Project duration 1 year from 1.4.86	Investigations of hepatic ischemia during liver transplantation.	
		Salary	
		Expenses	11,205
		Equipment	
		Total	11,205
8. The Royal Free	Dr P Griffiths Project duration 2 years from 1.8.84 Completion Date: 31.7.86	The use of restriction endonuclease analysis to determine the routes of transmission of cytomegalovirus.	
		Salary	2,518
		Expenses	200
		Equipment	
		Total	2,718
9. The Royal Free	Dr J M T Hamilton Miller Project duration 2 years from 1.4.85 Completion Date: 31.3.87	Resistance to trimethoprim among clinical isolates, with particular reference to Gram-positive bacteria.	
		Salary	7,086
		Expenses	1,000
		Equipment	
		Total	8,086
10. *The Royal Free	Dr M Y Morgan Project duration 2 years from 1.4.86	The prevalence of excessive drinking in the population served by Hampstead DHA and the cost-effectiveness of various interventional approaches in different sub-populations.	
		Salary	10,692
		Expenses	
		Equipment	
		Total	10,692
11. *The Royal Free	Professor Thomas and Dr A Lever Project duration 2 years from 1.4.86	Interferon production as a predictor of chronic infection in Hepatitis B.	
		Salary	7,180
		Expenses	3,000
		Equipment	
		Total	10,180
12. Friern Hospital	Mrs G Dunkley Project duration 2 years from 1.7.85 Completion Date: 31.6.87	Computerised Psychological screening of alcoholic patients: A clinical validation study.	
		Salary	11,379
		Expenses	500
		Equipment	
		Total	11,879
Islington H A			
1. Whittington Hospital	Dr D Jenkins Project duration 18 months from 1.7.85 Completion Date: 31.12.86	The cervical mucosal immune system in human papillona virus infection and cervical neoplasis.	
		Salary	6,532
		Expenses	375
		Equipment	
		Total	6,907

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
2. Whittington Hospital (District Offices)	Dr L Lessof Project duration 3 years from 1.4.85 Completion Date: 1.4.88	Prevention of arterial disease in general practice in an inner London district.	
		Salary	
		Expenses	15,000
		Equipment	
		Total	15,000
3. *Whittington Hospital	Dr P J A Moult Project duration 2 years from 1.4.86	An investigation of the role of atrial natruiretic peptide in clinical disorders of sodium metabolism.	
		Salary	13,264
		Expenses	1,266
		Equipment	
		Total	14,530
4. *Whittington Hospital	Dr J Skinner Project duration 1 year from 1.4.86	Evaluation of out-patient behavioural therapy for chronic pain.	
		Salary	1,980
		Expenses	377
		Equipment	
		Total	2,457
5. Whittington Hospital	Professor J Wyllie Project duration 2 years from 1.4.85 Completion Date: 31.3.87	Dynamics of dilating oesophageal strictures.	
		Salary	
		Expenses	1,988
		Equipment	
		Total	1,988
6. *Whittington Hospital	Dr J S Yudkin Project duration 2 years from 1.4.86	The role of cutaneous blood flow in determining variability of block glucose in labile diabetics and rebound hyperglycaemia.	
		Salary	
		Expenses	15,000
		Equipment	
		Total	15,000
North East Essex H A			
District Offices	Dr E G Jessop Project duration 2 months from 1.4.86	Mortality due to mental disorder in North East Essex 1981–84	
		Salary	
		Expenses	
		Equipment	1,350
		Total	1,350
Tower Hamlets H A			
1. *The London	Dr B J Boucher Project duration 1 year from 1.4.86	A study of the interferon system in insulin dependent diabetes compared to that in normal man.	
		Salary	8,643
		Expenses	
		Equipment	
		Total	8,643
2. *The London Medical College	Dr A Bowling & Dr A Silman Project duration 2 years from 1.4.86	An evaluation of the effectiveness of occupational therapy aids and appliances in reducing disability in the elderly living at home.	
		Salary	11,472
		Expenses	1,400
		Equipment	1,900
		Total	14,772

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
3. *The London Hospital	Mr A R M Coates Project duration 3 years from 1.4.86	Isolating and sequencing of human T-lymphocyte derived-macrophage—activating factors other than interferon-Y which kill micro-organisms and cancer cells.	
		Salary	7,252
		Expenses	3,900
		Equipment	
		Total	11,152
4. The London Hospital	Dr E Dykes and Dr F Ashfar Project duration originally 3 years from 1.4.84 Completion Date: 1.12.86	Computer generated three-dimensional sterotactic atlas of the human posterior fossa.	
		Salary	
		Expenses	100
		Equipment	
		Total	100
5. The London Hospital	Professor H Festenstein Project duration 3 years from 1.4.84 Completion Date: 31.3.87	Immune mechanisms of renal graft acceptance/rejection studied with cells aspriated with a fine needle.	
		Salary	6,109
		Expenses	1,000
		Equipment	
		Total	7,109
6. *The London Hospital	Professor Grudzinska Project duration 2 years from 1.4.86	Studies on the synthesis and metabolism of progestagen associated endometrial protein (PEP).	
		Salary	14,539
		Expenses	
		Equipment	
		Total	14,539
7. *The London Hospital	Mr J King Project duration 1 year from 1.4.86	Vibration analysis of bone healing.	
		Salary	2,319
		Expenses	250
		Equipment	300
		Total	2,869
8. *The London Hospital	Dr I Leigh Project duration 1 year from 1.4.86	Organotypical culture of psoriatric skin as a model of differentiation.	
		Salary	
		Expenses	1,500
		Equipment	4,000
		Total	5,500
9. *The London Hospital	Dr P M Speight Project duration 1 year from 1.4.86	Immunohistochemical analysis of labial salivary glands in 1° & 2° sjogrens syndrome diagnostic and prognostic potential.	
		Salary	4,230
		Expenses	2,352
		Equipment	64
		Total	6,646
10. The London Hospital	Dr I Stabile Project duration 2 years from 1.4.85 Completion Date: 31.3.87	Clinical evaluation of maternal papp-a measurements in abnormalities of early pregnancy.	
		Salary	10,777
		Expenses	
		Equipment	
		Total	10,777

Place of Work	*Grant Holder*	*Title of Research and finance required 1986–87*	
11. *The London Hospital	Dr D M Williams Project duration 2 years from 1.4.86	The mechanism of action of dapsone in the treatment of dermatitis herpetiformis and other vesiculobullous diseases of skin mucosa.	
		Salary	4,230
		Expenses	744
		Equipment	
		Total	4,974
**West Essex H A*			
Princess Alexandra Hospital	Dr J D Hardy Project duration 2 years from 1.7.86	Project outcome for babies less that 2 kgs in the Princess Alexandra Hospital (PAH) Harlow Special Care Baby Unit (SCBU) over a 5 year period compared with published results in medical literature and a descriptive study of the factors that may have contributed to the outcome.	
		Salary	4,160
		Expenses	1,000
		Equipment	2,070
		Total	7,230

NB.* indicates new project

Appendix C

NORTH EAST THAMES REGIONAL HEALTH AUTHORITY

Notes of Guidance for Locally Organized Research Grants

Before completing the grant application form it is essential to read the following information.

(1) *Introduction*

The Locally Organised Clinical Research Scheme (LORS) succeeded the centrally funded DHSS Locally Organised Clinical Research Scheme in May 1975. In 1978 the administration of the scheme was devolved to Regional Health Authorities (RHAs) and Boards of Governors and the central monies were distributed and thereafter included in the total revenue allocations.

The Regional Research Committee (RRC) administers LORS on behalf of the RHA. It comprises 19 members who are chosen as far as possible to represent the interests of teaching and non-teaching districts, clinical research and more recently Health Services (operational) research.

The committee meets approximately 4 times a year (between October and February), primarily to discuss the funding of new and continuing projects submitted under LORS. Applicants are informed of the outcome of these discussions in February and March.

(2) *Aims of the scheme*

The aims of the scheme are to foster a spirit of enquiry and to discover and encourage local research talent within the Health Service.

2.1 It is intended that the scheme will provide Health Service workers with an opportunity to undertake projects which:

(a) are relevant to their day to day practice and interests

(b) enable them to further their research experience

(c) contribute to their training and career advancement

2.2 Schemes supported under LORS should:

(a) relate to health care problems

(b) meet acceptable standards of research methodology

(c) conform to recognised ethical standards

2.3 This scheme is not intended to provide for costly or long term work which is of national importance and undertaken by central bodies, that is the MRC for Medical Research and DHSS for Health Service Research. However pilot investigations initiated by LORS, if they prove to be promising, may attract such central support.

(3) *Who may apply*

The scheme is open to all Health Service professionals holding a contract of employment (paid or honorary) with a Health Authority or those who make arrangements with the Family Practitioner Committee for provision of services. Those who work in the community, hospital health services or medical schools are eligible.

(4) *Terms of availability of grants*

4.1 All requests for grants must relate to specific and well defined research projects.

4.2 The duration of the project should not normally exceed three years.

4.3 The estimated total cost of the project should not normally exceed £45,000 for a project lasting for three years, proportionally less for a project of shorter duration or £18,000 in any one year. The purchase of equipment should not exceed £8,000 in total.

(N.B. These totals may be revised in the light of inflation)

4.4 Grants may include:

(a) The whole or part-time salary of research assistants who must be employed on fixed term contracts of not more than one year. If the grant is for two or three years such contracts would normally be renewable for the duration of the project. Assistants must be employed on appropriate Whitley Council grades.

N.B. (i) Projects requiring the whole-time appointment of staff of Senior Registrar Grade or above (or equivalent non-medical grade) are not considered to be appropriate to the scheme.

(ii) Research applicants may not apply for their own salary.

(b) Travelling and incidental expenses necessary to the project in accordance with appropriate NHS rates.

(c) The cost of consumable materials.

(5) *Points to note about completion of application form*

5.1 Only those applications submitted on the prescribed form will be accepted. They must be typewritten.

5.2 The date for receipt of applications at the RHA will be strictly adhered to; applications received after the specified date will be returned to the sender.

5.3 *Location*—The location of the study should be identified precisely.

5.4 *Abstract*—The abstract should not exceed 100 words and should give the following information.

(a) the question to which you are seeking an answer;

(b) the methodology to be employed.

5.5 *Proposed duration and starting date*—The NHS financial year commences on 1 April and therefore the funding for projects will be available from that date.

5.6 *Summary of support requested*—All supported staff must be employed and paid at current Whitley Council/NHS terms and conditions. Information on salary costs MUST be obtained from your Hospital, District or FPC Finance Department.

5.7 *The estimated cost of the project*—This applies at the date of application. Any adjustments for inflation will be made by the RHA when the grants are approved.

5.8 *Other support*—Full information must be provided about other support that has been applied for or obtained. If any support for the project is subsequently obtained from other sources, the secretariat must be informed immediately.

5.9 *Equipment*—Costs should be listed, including VAT if applicable. Where computer equipment is included, advice on selection should be sought from local computer committees or from the Regional Computer Centre.

5.10 *Named collaborators*—Indicate the extent of collaboration and obtain the signature of collaborators.

5.11 *Clearance by Ethical Committee*—The responsibility for clearing projects with the Ethical Committee rests with the researcher, and projects MUST be approved before submission.

Researchers should observe guidance given by the Royal College of Physicians (Guidelines on the practice of ethics committees in medical research: London RCP. 1984), and the Medical Research Council (Responsibility in the use of medical information for research. Statement by the MRC, 1972) on investigations on human subjects. All other appropriate standards must be observed including those for data protection and requirements for animal studies, that is quote the project licence number for work involving experiments on animals.

5.12 Applications should be presented in sufficient detail to make the purpose, scope and protocol of the proposed research clear. They should conform exactly to the structure laid out, on page 4 of the grant application form.

(a) *Proposed investigation*—In most cases this section should contain a clear statement of the hypothesis(es) to be tested. It is, however, recognised that some projects are of a "descriptive" or "data collection" nature and in this case it should be clearly stated in what ways it is expected that the results of the projects will aid subsequent service or research work.

(b) *Background*—This requires an account of work already done, by the applicant or others, leading to the enunciation of the purpose stated in (a). If pilot studies have already been undertaken the results should be stated concisely.

(c) *Plan of investigation*—This should contain a detailed protocol of the investigation. It is frequently advisable to take the advice of a statistical expert when designing the protocol and applicants who are not statistically expert should indicate what arrangements have been made for such guidance both before and during the course of the project. It is not sufficient to state (for instance) that a "randomised controlled trial will be made of the efficiency of treatment A versus treatment B". Full details must be given of the organisation of the trial, and how it is to be evaluated statistically.

(d) *Reasons for support requested*—If the request includes the salary of a research worker, the proposed duties of that person should be described and the extent to which other (named) individuals will be involved in the project. If equipment is requested, it must be ascertained and stated that free time on similar equipment in the applicant's work-place is not available. Costs should include VAT where applicable.

(e) *Relevant references and bibliography*—These should be indicated and copies of published papers or papers in print may be attached if they are relevant to the application.

5.13 *General points about completion of the form*

(a) References should be selective in order that they may be consulted by assessors.

(b) If relevant a brief resume of a pilot study should be included.

(c) Brief curriculum vitae of named staff should be attached to the application.

5.14 *Computer searches*

Computer searches can be obtained from the Holborn Branch of the British Library, 25 Southampton Buildings, Chancery Lane, WC2 1AW. Written or telex request should be addressed specifically to the Science Research Library Computer Search Services.

It is important that request for searches should be kept specific, and costs may be reduced if the researcher makes an appointment to participate during the search with the computer operator.

The North East Thames Regional Library Services publishes a Directory of Libraries and Information Services' annually, and this includes details of on-line services available in the Region.

(6) *Preliminary processing of applications*

6.1 Applications for grants from employees of DHAs should first be submitted to the local Hospital Research Committee, or where such does not exist, forwarded directly to the District General Manager. Supported projects will then be forwarded direct to the Region.

6.2 Applications from Family and Dental Practitioners should be forwarded direct to the Research Secretary (LORS) at NETRHA.

(7) *What happens to your application form at RHA*

7.1 Your application will be acknowledged.

7.2 Inaccurate or incomplete forms will be returned for further attention.

7.3 Applications will be treated in confidence. Views from independent referees may be sought at the discretion of the Regional Research Committee.

7.4 Applications will be considered by the RRC at the earliest available meeting; applicants will not be invited to attend the meeting.

7.5 In some instances proposals from inexperienced researchers which show merit but are inadequate in content may be passed to a member of the RRC for further discussion with the applicant.

7.6 You will be advised of the outcome of your project in writing; information will not be given over the telephone.

(8) *Progress and final reports*

Approved schemes with a proposed duration of 2/3 years will be supported on the understanding that funding of the second and/or third year will be dependent on receipt by the RRC of a satisfactory annual progress report. Researchers whose projects are being funded from LORS monies will be contacted when the report is required and a form supplied. A final report on completion of the project will be required from all applicants who receive grants.

Progress Reports—These should provide sufficient details to enable the committee to assess whether the objects of the original application are being pursued and whether progress is being made. When the project has been in progress for only a few months only a brief report is required but at other times the format should be as follows:

(a) A brief statement giving the following details:
  (i) name of current research assistants
  (ii) their place of work
  (iii) the duration of study at the date of the report
  (iv) any revision to the date of completion

(b) A short restatement of objectives for which the grant was originally awarded (limited to 150 words).

(c) A clear concise summary of the work so far achieved making clear:
  (i) the extent to which the objectives are being fulfilled, and also the nature of any difficulties being encountered
  (ii) whether these objectives have been modified in view of the results obtained, and if so, how they have been varied.

(d) An outline of the aim of the research during the remaining period of the project.

(e) Plan of the continued investigation and the methods to be used.

KC/DJ

January 1987
(Revised)

Appendix D

APPORTIONMENT OF REGIONAL RESEARCH FUNDS

Cuts in UGC and MRC funds and the effects of inflation on the Regional Research Allocation have led to increased competition for grants under the LOR Scheme in recent years and undoubtedly this partly explains why members of the Committee have from time to time questioned whether the current method of apportionment of the sum allocated by Region for the LOR Scheme should be revised. Views that have been expressed have implied that the present method of apportionment (a) is unfair to non-teaching hospitals, GPs, non-medicals and Community health projects (b) sometimes results in excellent projects not being funded whilst less good projects are supported (c) often fails to meet an obligation to enable inexperienced researchers to gain experience.

Last year it was agreed that the current procedure should be reviewed and this brief paper has been prepared to aid the Committee in debating the issue.

The current method of apportionment and its background

For the years commencing 1 April 1984 and 1985 the sum of approximately £500,000 was initially divided into 7 equal parts as follows:

(1) £72,000 reserved for projects from St Bartholomew's

(2) £72,000 reserved for projects from The London

(3) £72,000 reserved for projects from The Middlesex

(4) £72,000 reserved for projects from The Royal Free

(5) £72,000 reserved for projects from University College

(6) £72,000 reserved for projects from Hospitals in other Health Districts

(7) £72,000 reserved for projects from GPs and non-medical staff or involving Health Services Research

After approval of continuing and new projects within these budgets unallocated monies were subsequently distributed as fairly as possible between the best of the remaining acceptable but unfunded projects.

Prior to the year commencing 1 April 1981 the Regional allocation has been divided into five equal parts, four sub-budgets of 1/5th of the total were reserved for projects from each of the four teaching hospitals then in the NE Thames Region, and another 1/5th was reserved for all other projects. At that time only the Teaching Hospitals submitted sufficient numbers of acceptable projects to fully utilise their allocation.

For the year commencing 1 April 1981 the allocation was divided into six equal parts to allow for the creation of an additional sub-budget for projects which were submitted by GPs, Community Health Physicians or non-medical staff. The apportionment then was 1/6th of the total to each of the four teaching hospitals, 1/6th to the non-teaching hospitals and 1/6th for projects coming from the categories of staff referred to above. This change was made because the Regional Research Committee considered that such staff required encouragement to submit projects. At that time the quality of projects received from the non-teaching hospitals increased substantially.

As from the year commencing 1 April 1982 the allocation has divided into 7 equal parts, the change from 1/6ths to 1/7ths becoming necessary to allow for the alteration of the Regional boundaries which brought the Middlesex Hospital into the NE Thames Region. At that time only £16,000 was transferred from the NW Thames RHA to cover the costs of the on-going projects which were transferred. From that time the initial uptake of the allocation from all the sub-budgets has increased to the point that little or no money is available for distribution in the second round and all parties feel squeezed.

Some possible alternative methods of apportionment of the funds

(1) *Have no earmarked sub-budgets*. The Regional allocation would be distributed solely on the merits of the projects.

Comment. This approach could well lead to nearly all the monies going to projects from the Teaching Hospitals.

(2) *Give non-teaching hospitals with academic staff a separate sub-budget*. The Regional allocation would be divided into eight equal sub-budgets.

Comment. This approach would reduce each sub-budget to about £62,500 and increase the difficulty of matching project costs against available funds.

(3) *Regarding twinned teaching hospitals (Bart's/London, Mddx/UCH) as one.* The Regional allocation would be divided into five equal sub-budgets.

Comment. This approach would produce an unjustified advantage for the RFH.

(4) *Give all Districts a basic share and add a supplementary allocation based on the numbers of students being taught.* The Regional allocation would be divided on the basis of an appropriate formula such as applies with the SIFT allowance.

Comment. This approach assumes that the quantity of sound research could be related to the numbers of students being taught.

OPTIONS FOR THE COMMITTEE

It is suggested that no methods of apportionment of the Regional funds will satisfy all parties but that the Committee should choose a method which is compatible with a policy which has the twin aims of encouraging both beginners to embark on research and experienced workers to prosecute the best research. To this end it is proposed that unless the Committee can propose a better alternative to those outlined above it should choose either

(1) continuing with the present method of apportionment, or

(2) adopting one of the alternative methods outlined above.

F V Flynn

August 1985

Appendix E

CENTRE FOR THE STUDY OF PRIMARY CARE

North East Thames Regional Health Authority

1. INTRODUCTION

Acknowledging the need to shift the balance of care to the community the North East Thames Regional Health Authority in its Regional Strategic Plan 1978–88 proposed a programme of short term and long term measures for remedying deficiencies in general practice and primary care which it saw as one of its key objectives over the strategic planning period.

This programme was originally put forward by the Working Party on Primary Care, Study Group B set up in the Region in 1976. An innovatory element of the programme was the establishment of a Centre for the study of primary care located in Inner London. It was envisaged that the presence of the Centre would act as a stimulus to local primary care, and also to Regional and National approaches to primary care. The Centre staff would be from general practice, community nursing and social sciences and would have formed links with academic departments.

In accordance with this, the Centre for the Study of Primary Care was established in 1983, and has three distinct functions: research, development and training. Priority areas for research were set out in the Regional Health Authority Strategic Guidelines for 1983–1993 and in the first phase of the Centre's funding emphasis has been on community care of the elderly, teamwork in primary care and the role of primary care in prevention and health promotion. Apart from carrying out basic research from within the Centre, the staff also engage in collaborative research with others in the Region and serve as a resource for advice on research methods and design in relation to primary care projects. The definition of primary care that has been adapted is a broad one which recognises the contribution that lay people make to health care as well as health professionals and take a multidisciplinary approach to these issues. In addition, the Centre is concerned not only to generate empirical and descriptive research, but also to translate this as far as possible into practical applications and to evaluate outcomes.

Details of past and ongoing projects are listed in the Yearbook. In conjunction with the appointment of a new senior research fellow, research into the attitudes of primary health care professionals to prevention and health promotion are being undertaken. In addition, research into lay and professional perceptions of mental handicap and the influence of these on the delivery of care is being carried out.

Primary Health Care

Concern for the people who receive health services rather than for those who provide them has increased over the last twenty years. Primary health care is the strategy adopted by the World Health Organisation as the means by which health care for all will be achieved by the year 2000. This has been accepted by most countries though many remain doubtful as to how it may be achieved, what are the standards, who

will manage it and what will be the contribution and the roles of the participants. The Centre was set up in a primary health care site to explore some of these issues.

Primary Heatlh Care Teams

The team approach to primary health care is seen as being the most effective way to improve care in inner cities. Improved teamwork was one of the recommendations of the Acheson Report (1981) and the Harding Report (1981) suggested basic principles for satisfactory integration of the primary health care team:

— a common objective for the team which is acceptable and understood by each member of the team

— a clear understanding by each member of the team of their own role function and responsibilities

— a clear understanding of each other's roles, skills and responsibilities

— mutual respect for the role and skills of each member of the team allied to a flexible approach.

However, whilst the concept of teamwork is generally accepted, problems exist in respect of its working definition, attainment and functioning. Teamwork in this Centre has been explored through multidisciplinary workshops and by supporting research into the use of a facilitator in primary health care settings. It has also formed a central theme in research looking at the work of the health visitor and the district nurse in relation to the elderly.

Prevention and Health Promotion

It has been argued that disease has not been prevented by treatment of the sick but rather by modifying the factors facilitating its occurrence. The encouragement of behaviour that reduces or avoids the risk is seen as a logical development in the provision of primary health care. The World Health Organisation's suggested aims for health promotion are:

— to make health a valued asset

— to help individuals become competent to carry out those activities they must undertake for themselves in order to realise fully the state of complete physical, mental and social well being

— to promote the development of proper use of the health services.

These ideas have been reflected in changes in United Kingdom government policy over the past decade and are particularly evident in the recent government green paper, *Primary Care: an Agenda for Discussion* (HMSO, 1986). The Centre is endeavouring to contribute to the evidence on prevention and health promotion by carrying out major surveys of the perceptions, attitudes and reported practices of general practitioners and community nurses in respect of their roles and responsibilities for these aspects of Primary Care. Among the objectives is the aim of identifying the barriers and constraints on carrying out these activities which may be amenable to modification through educational programmes and more generally to provide firmer evidence for models of "good practice" appropriate to professional and lay needs.

The Role of Primary Care in Relation to Community Care

The concept of community care has become a central theme in health policy initiatives in the past decade. The deinstitutionalisation of the disabled, the mentally ill and the elderly and frail and the provision of alternative forms of care in the community are policies being pursued by health authorities. In view of the fact that relatively little evidence exists on the impact of these alternatives, the Centre is engaged in a series of studies that look at the contribution that Primary Care services can make in the care of vulnerable groups such as the elderly and those suffering from common chronic disorders. A particular emphasis in these studies is the impact that primary care workers can make in avoiding the unnecessary admission of such people to hospital as in-patients or as long term attenders at outpatient clinics. In particular, we have carried out controlled studies examining the effects of community nurses on morbidity in the elderly and are planning a major comparative study of the effectiveness of the care of patients with cardiovascular disorders in general practice and outpatient clinic settings.

Priorities in Medical Research and the needs of Primary Care: response to the Sub-Committee's Questions (a)–(d)

Apart from its recent response to the spread of AIDS, central government has on the whole tended to devolve much of the decision-making on medical research funding onto the grant-giving bodies, in particular the MRC. The extent to which these bodies operate within a particular set of priorities varies, some being more reactive to popular or political demand than others. Whilst there has since the mid-1970s been a shift towards greater "customer" (or funding body) determination of the content of medical research, the overall reduction in public resources available to the main funding bodies has tended to undermine much of the logic of setting priorities. Hence, one finds greater incidence of short term research projects that are responsive to the public agenda but which, in terms of primary care, contribute little in the way of practical benefits to patients or the providers of health care. Nevertheless, there is evidence

that the major funding bodies, both the public and large private charitable foundations, are increasingly setting priorities for research in the medical field.

A further set of influences relates to the way resources for research are allocated. Academic departments and research institutions that have a track record in research and have in the past been the recipients of grant funding continue to attract major funding irrespective of changing patterns in health and health care. For example, the evidence of the Black Report on Inequalities in Health (DHSS, 1980) demonstrated that the material conditions in which people live, mediated through enduring systems of culture and behaviour, are major determinants of mortality and morbidity in the British population, yet the majority of medical research continues to focus on acute interventions and associated therapy, rather than care of the sick and long term prevention. Reduction in mainstream funding to the Universities, Polytechnics and affiliated research institutes and centres has indirectly tended to reinforce this pattern by increasing pressure on them to secure external funding. Hence, there is less inclination to submit proposals for new, original research, and conversely a tendency to request funding for replication studies or elaborations of previous projects.

Set in this general context, research into aspects of primary care is often at a considerable disadvantage. Until recently, it has lacked a firm academic basis on which to make the case for a change in the priorities for medical and allied research. Its central concern with the provision of health care within the community, increasingly to the chronically sick, and with the prevention of disease and the promotion of health are in sharp contrast to the interests of many of the medical specialisms that command the majority of grant funding available. Hence, there is relatively little investment of resources in the study of the major causes of disease, how people and families cope with illness and try to maintain health or on the contribution that primary care services can make to this process. From the experience of the staff of this Centre, much of the funding for research into aspects of primary care has come from non-medical sources, for example the Health Education Council (now Authority), the Nuffield Foundation, the Economic and Social Research Council, and has been carried out by social and behavioural scientists and nurse researchers working in collaboration with clinicians.

In summary, the experience of those working in this Centre is that priorities for research and the distribution of funds do not reflect the broader changes in the patterns of disease and the social context in which they arise, or the specific contribution that Primary Health Care Services makes to curing and alleviating illness and maintaining and promoting health. The North East Thames Regional Health Authority's funding of this Centre is one (relatively unusual) example of an attempt to redress the inequity that exists in research effort between the primary and secondary care sectors in medical research. However, regional and district health authorities are not resourced to be major grant giving bodies for research and the problem of attracting external funding for large scale or long term research prospects in primary care remains. Research in primary care is also at a disadvantage in terms of its time-scale compared to experimental, laboratory based investigations. Much primary care research involves complex sampling procedures, soliciting opinions through formal questionnaires, interviews and the recording and observation of activity—all of which are generally more labour intensive and time consuming.

The organisation of research activity and who benefits from it: response to the Sub-Committee's Questions (e)–(l)

The Centre for the Study of Primary Care is in the relatively privileged position in that it has funding for its core staff (3 full time professional researchers and two part-time admin/secretarial) for an initial period of five years, currently extended by a further two years. However, the general trend in research is towards short term projects (most three year projects are reduced to two or two and a half year funding lengths). Whilst at one time it was possible for postgraduates to aim for a career in research, the instability of funding and the insecurity that generates discourages many from a major long term commitment. In the experience of this Centre, maintaining the enthusiasm and application of staff on short term projects is increasingly difficult in view of such deterrents as redundancy waiver clauses in contracts, uncertainty about sickness and maternity benefits and absence of career "tracks" for the motivated.

Dissemination of research findings is one area that has suffered from short-term funding and lack of continuity in employment in medical research. Researchers lack the time to disseminate their findings in written form to the different potential audiences. In view of the reduction in resources available for research, it may at times also lead to a reluctance to disseminate until publications have been secured. Whilst this might lead to *duplication* of medical research effort, it is often confused with (at times) useful *replication* of research studies which substantiate earlier studies and also for primary health care workers create personal involvement. General Practitioners, for example, often claim they learn a great deal simply from participating in research projects as opposed to reading publications in scholarly journals.

It may also be that there is a tendency to attribute too much to the failure of researchers to disseminate their findings, as opposed to a failure to document applications or to evaluate the outcome of attempts to implement programmes based on research findings. For this reason, part of this Centre's function has been to provide expertise and resources for evaluation of new initiatives in primary care, which presently

include the evaluation of training programmes in health promotion and mental handicap, and to integrate this with developmental and planning work in primary care at district and regional levels.

Conclusion

The vast bulk of all disease is seen initially in Primary Care settings, and the greater part of the whole population present from time to time—thus providing opportunities for research in these areas which pose important questions about the most effective and appropriate use of resources:

(1) The parameters of teamwork which produce better cooperation, communication, satisfaction and outcome.

(2) The effectiveness of different methods of health promotion and prevention.

(3) The transfer of care of most chronic disorders from secondary to primary care.

(4) The evaluation of non drug therapies.

(5) The prevention of institutional care and emergency admission.

The establishment of the Centre for Primary Care has enabled funds to be earmarked specifically for primary care with appropriate regional guidelines. Funding research in this manner can give much more relevant research, particularly in the primary care field, which can assist decision making in the best use of NHS resources.

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28 *April* 1987

Appendix F

A Regional Research and Development Strategy

1. In the Strategic Plan for 1978–88, a section was included entitled "Studies to Improve Future Planning". This was intended to promote developments in planning methodology and in the provision of relevant information in order to improve the next Strategic Plan. This was a major innovation which has had some beneficial effects in directing, among other things, management services programmes towards following up some of the leads identified in that section. It is now proposed to develop this innovation a stage further, by widening its compass to comprehend an outline health services research and development strategy for the Region. This strategy proposes therefore, as it did in the 1978–88 Plan, a series of new and continuing studies into planning methodology and the information needs for management and planning; but it also includes proposals for investigating major substantive health care issues which are considered central to the Region's health care objectives.

2. From an inspection of the proposals put forward in the 1978 Plan, it is clear that some types of work have been easier to put in hand than others. In particular, the multidisciplinary studies and the community medicine projects have proved the most difficult to initiate. However, the need for such studies is, if anything, greater now than it was five years ago.

3. The proposals for the Regional Specialities contained in this Plan have been based on an assessment of epidemiology and medical "need", as well as a crude evaluation of the benefits of the various therapies available. Undoubtedly, this assessment could be more reliable if we had better and more extensive information, but this new approach is considered to be an important innovation which should be developed and applied more generally.

4. At its basic level, the Region is providing services of various kinds for its population by way of direct care for individuals, and by preventive measures for groups within its population. A clear appreciation of the quality and quantity of these services must in the long run be indispensable to the Regional planning process. Furthermore, it is necessary to know how these services are affected by differing volumes of the basic resources of finance, activity, manpower and estate. It is also necessary to be able to select between

differing therapeutic regimes, with differing costs whether these are in terms of manpower, drugs, supplies or major equipment.

5. In order to link all these factors together, or indeed to begin to provide life-time care to cope with chronic or life-time diseases, it will be necessary to provide life-time patient records, to which an individual's doctor can have access. The episode based data in our National Health Service statistical systems are just not capable of yielding the information needed either for patient care or for effective planning of the Health Service.

Progress to Date

6. It is not necessary to attempt to record every facet of Regional informational development activity since the last Strategic Plan was published. However, some of the more important projects that have been undertaken are looked at below.

(i) *The Bed Census*

A detailed census was undertaken of patients in hospital beds across the Region in the wake of the 1981 national census. The data collected during this study is still being analysed, but already it has provided some important insights into the way in which beds are being used in the Region. It suggests that changes should be made to the factors in the RAWP formula that may have significant implications for revenue targeting within the Region. The bed census data has been linked with the Regional Hospital Activity Analysis records, to provide a very powerful database for the examination of bed usage by age, sex and diagnostic condition—as well as by social factors. The last part of the analysis to be issued will be an exploration of nursing dependency on wards. Reports are already available on Patient Census Methodology and Patient Census Study—Social Factor Analysis.

(ii) *Statistical Database*

The volume of analysis required to produce a Regional Plan is now so substantial that it can no longer be handled efficiently with the aid of books of statistical data and a calculating machine. Nor is this approach suitable for monitoring Regional activity. Accordingly, the main statistical data has been collected on a monthly basis; and a computer system devised which can hold historical material for many years for detailed analysis of such parameters as bed occupancy, turnover interval and throughput as a basis for future projections of system behaviour. This statistical database has now put the statistical systems of the Region on a firm footing for integration with the financial and manpower systems.

(iii) *Regional Computer Network*

The Region has now set up a Regionwide computer network using CASE equipment which has the capacity of linking all the computer systems together for data input and validation; for direct access to the whole Regional database; and for analysis of this material. In principle, it allows the opportunity of exploring in detail the implications of differing approaches to health care and of testing their viability. This improved computer communication system provides an essential component of the system needed by the Health Service if it is to use the new (Korner) minimum information data sets. The availability of powerful and cheap microcomputer systems means that such systems will be able to operate at the clinical level, collecting relevant operational information for patient management. This latter can also be used to provide relevant information for the Region's managerial systems. More work needs to be done in developing convenient access through the network to the various data systems.

(iv) *Gravity Modelling*

Given the national wish to allow patients and their doctors freedom of referral, patients can and do travel well outside their local District for the services they seek. The implication of this is that each District has a catchment population for which it is responsible which will encompass much of its resident population, but also includes inward patient flows from other Districts as well as outward flows into other Districts. In general, if a major facility is set up in a District, patients will flow into it. Correspondingly, the lack of such a facility will mean that patients will go elsewhere. Thus it is clear that the major capital building developments will have an impact on patient flow, and consequently on local acute planning populations.

In order that the Regional Health Authority might advise each District of their planning population for local acute services (that is their expected catchment population), it was necessary for the Region to assess the future flow patterns. This involves taking account of the new hospitals, planned closures and forecast population changes. To do this a Gravity Model was developed, based on earlier work undertaken by the Operational Research Service of the Department of Health and Social Security. It also used the results of some previous studies on patient travelling within the Region, together with additional information from the bed census.

In recent months the Gravity Model has been further developed to predict local acute hospital admission rates (discharges and deaths per thousand resident population) consequent upon a

given disposition of resources, in addition to planning populations. The revised Gravity Model is fully described in the technical annex to this Plan.

As the Districts' plans developed and the full list of major starts became clearer, the Gravity Model was re-run to examine the effects of all the proposals on hospital admission rates and planning populations. In assessing the consequences of District plans, full account has been taken of the differences in usage of local acute beds by age, sex and socio-economic group identified by the bed census.

The Gravity Model takes as its input the projected local acute activity (discharges and deaths) in each District. The effects of modifying the activity assumptions made by Districts, for example to take account of Regional trends in local acute hospital admission rates, have been assessed through repeated runs of the Gravity Model.

(v) *Survey of Accident and Emergency Services*

During the last few months a Regional study of Accident and Emergency Services has been undertaken to identify the catchment population of each Accident and Emergency department in the Region. These results, together with the results of previous studies on patient travelling within the Region, have been used to identify the likely effects of proposed closures on access to Accident and Emergency services. A model of the relationship between usage of Accident and Emergency services, age, sex, social class and access has been developed, to estimate the numbers of new and total attendances of each remaining Accident and Emergency Department after closures. Account is also taken of historic trends in Accident and Emergency attendances and forecast changes in resident population to provide workload estimate for each Major Accident and Emergency Department by 1986 and 1991.

This study complements the operational research models which have been developed over the last few years to explore the implications of closing specific departments, and to see whether it was feasible to close them and handle the additional workload elsewhere. Further use will be made of these models in implementing the general Regional policy of seeking only one substantial Accident and Emergency Department in each District unless there is good reason for maintaining additional facilities.

(vi) *The Regional Statistical Review*

The internal review of Regional statistical systems which was rehearsed in the last Plan has now been subsumed into a major national exercise (Health Service Information Steering Group—Körner Committee) aimed at a total re-examination of the various statistical systems of the National Health Services. This exercise is a major activity that will take some time before it is complete and the full beneficial effects become apparent.

(vii) *Studies on Mental Illness*

Previous studies on the rates of rundown of large mental illness hospitals have been updated and adapted to provide planning information to assist the Region's specific strategy for dispersing services from Friern and Claybury Hospitals and the general policy of running down all large psychiatric hospitals. Similar studies have been set in train to provide analogous planning information to facilitate the rundown of the large mental handicap hospitals, an important strand of the Region's priority services strategy.

(viii) *Regional Specialities*

In this Plan the assessment of the Regional Specialities was undertaken on the basis of a detailed epidemiological review of the needs in these specialities, an assessment of the benefits of the types of therapy available, and the expected future trends in these factors. The development of this approach has the merit of focusing attention on the key issues. This work has also reinforced the need for the rapid development of a system to generate compatible speciality costing information.

Future Research and Development Strategy

7. Since the 1978–88 Strategic Plan a major change in circumstances affecting the Region has been the financial pressure exerted on the Health Service generally and particularly the North East Thames Region resulting in a sustained reduction in resources available. A further constraint has been imposed in the form of enforced manpower reductions.

8. A second important change has been the emphasis on management accountability and the resulting systematic measurement of performance.

9. These changes have added a new focus to the Region's future Research and Development Strategy, the main element of which will include:

(i) *Productivity and Effectiveness in Health Care*

The questions of productivity and effectiveness in the provision of health care must be dominating ones during the period of this Plan. This will require multidisciplinary efforts to make sure that patient care is maintained and improved, rather than that patient services are cut while the bureaucratic system is maintained intact.

As the details of the Strategic Plan are worked out, more precise objectives will be developed. Hence it will be feasible to be more radical in the approach to the specifics of care. The balance of care between hospital and the community is a matter for continuous adjustment as new techniques are developed and new facilities become available. In addition, as the basic patient benefits of care become clearer, it also becomes easier to be more precise in the therapies that should be offered to patients. There is also scope for a pharmaceutical contribution to research involving evaluation of alternative therapeutic strategies and prevention. In all this, the involvement of the medical and nursing professions in particular will be crucial. However, this must be backed by operational research system studies which will highlight the interrelationship between activities, assist in the exploration of policy options and support the decision makers. One of the tasks that Region has adopted is that of a Rayner Scrutiny into "Bed Management"; this to be carried out towards the end of 1984–85.

(ii) *Quality of Health Care*

Quality of care is more than simply technical effectiveness against some professionally determined yardstick. It includes this; but it also includes the very important dimension of patient acceptability. The challenge is to devise valid and reproducible measures of both aspects of quality and to devise methods for incorporating both into a single meaningful yardstick. These two areas are the basis of the Region's established development work on Performance Indicators, which are intended to give a quantitative basis to management at both District and Regional levels.

(iii) *Clinical Budgeting/Specialty Costing*

The Report of the NHS Management Enquiry placed great emphasis on the need for clinical staff to assume responsibility for the financial consequences of their actions. This obviously implies that a system of clinical budgeting and cost reporting must be introduced. Five Districts within the Region already have specialty costing systems and a Working Group was set up in 1983 to oversee the development of these systems on a compatible basis to all Districts. Following the publication of the Management Enquiry Report, the Working Group has been greatly strengthened and will be supplemented by external consultancy effort. It is intended that systems of clinical budgeting and speciality costing will be progressively introduced over the next two to three years.

(iv) *Development of Population-based Information Systems*

The Health Service's statistical systems have been built, in the main, on the basis of episodes of patient care provided at a particular institution rather than on the basis of a record for an individual member of the population. This approach—perhaps sensible when it was devised—is now totally anomalous in the present situation where the Service is expected to provide care for chronic conditions and diseases that are heavily influenced by the environment and life-style habits. In some sense, this approach was recognised in setting up the Cancer Registration system. It was also implicit in the 1974 Act which reorganised the Health Service; attention was directed away from the management of institutions towards the provision of services for the population.

Unfortunately, neither the managers of the service nor the planners have pressed sufficiently hard the case for effective record linkage.

(v) *Manpower Planning (including Manpower Record Systems)*

Section D3 of the Plan describes the various activities which the Region has initiated and which are under way. These, in the main, concentrate on the various aspects of manpower record systems, as the Authority recognised at an early date that, to develop a robust Manpower Planning System, a reliable and sensitive data base was required. With these various initiatives in hand the Authority now intends to turn to the larger and more challenging task of developing a Manpower Planning Model. It is intended that the Model should take into account the many factors which contribute to the overall task of predicting the Region's manpower needs in the future; demand, supply, performance, staffing levels, and so on. What is quite clear is that the Model must be based on *service development projections* as well as taking into account financial constraints. This work will need to follow and be closely interdigitated with the work on development of service and financial planning models.

The Authority is fully aware that totally integrated manpower planning in the NHS has been either poor or non-existent to date; this makes the task ahead even more formidable. In view of this it is the intention of the Regional Health Authority to look to expertise both inside and outside the Service and it considers, as an absolute prerequisite to the success of this undertaking,

that those District Health Authorities who wish to be involved in the task ahead should fully participate in the many aspects of this project.

(vi) *Medical Manpower Planning Systems*

The search for cost improvements and the need to take action to redress the overall career balance problem in hospital medicine has put a premium on developing specific medical manpower planning systems which will also take into account the complexities of the postgraduate medical education system.

(vii) *Operational Research Applications*

As the process of planning becomes more refined, it will be necessary to develop more refined methodologies for handling the Region's planning. The initial steps were virtually self-evident. But as the basic geographical and care group imbalances are rectified, it will be necessary to have more refined tools with which to explore options and to select the best location for services—both in planning and in local managerial contexts. Much work remains to be done in assessing the implications of providing and siting services, and their relation to the population served.

There is no reason why the Health Service should not have a very efficient distribution and supplies network using current industrial standards. A saving of a few percent of the large sums involved would release substantial resources for patient care.

In order to assess the implications of a particular plan, it is necessary to be able to start with an analysis of the resident population by age and sex, convert this into a catchment population by age and sex; and then assess the amount of services required by that population. These then have to be translated into requirements for manpower, supplies and estate; which, of course, then are translated into finance. The development of effective models of this system will enormously assist the Region's planning capacity and its confidence in its reliability.

(viii) *Information Systems*

During the life of this Plan, it will be possible to pull together the enormous potential of the Region's information systems. The rationalisation of the statistical systems in the wake of the Health Service Information Review (Körner), the integration of the systems with operational systems and the capability of modern computing systems, should all allow the Region to have access to powerful and effective means of monitoring its health care activities. It is intended that Districts and Region should have common access to the data system thus obviating the need for separate systems. It will also enable it to explore differing scenarios for the interaction of trends in activity and planning options. This type of decision support should considerably assist in defining options.

(ix) *Medical and Nursing Research*

There are many studies of aspects of medical and nursing activity that are open to detailed examination and modelling in ways that can help improve the performance of specific tasks. Since the major part of the activity of the Region rests in some measure on these medical and nursing activities, any improvements that can be achieved could have substantial implications and benefits.

As was indicated in the last Plan, a more streamlined approach to surgery might help with some aspects of the management of waiting lists. Further examination of the care of elderly people could also be particularly productive. Indeed, all bottlenecks in the provision of patient care need careful and rapid examination.

(x) *Health Promotion and Prevention*

The priorities and targets tested in Section B3 need to be backed by a serious effort in monitoring, information dissemination and modelling to ensure that the drive for better health proceeds rapidly and effectively.

(xi) *Primary Care Research*

The previous Strategic Plan identified the need to promote evaluation and research studies in the field of primary care because the achievement of the Region's strategic objectives was based on effective primary care. This basis remains, and the Region will promote primary care research through the aegis of the Centre for the Study of Primary Care which has been established as a direct result of the Region's 1978–88 Plan.

Other specific evaluative and research needs are identified in the various service sections of this Plan.

(xii) *A Mechanism for promoting the Research and Development Strategy*

As important as identifying a programme of work to improve the process and substance of the planning of health care in the Region is the creation of a mechanism for putting it into effect.

One of the functions of the recently established Regional Health Services Research Committee will be to promote the aims of this programme by commissioning relevant health service research studies.

10. *Funding Health Care Research and Evaluation*

The Health Service is traditionally reluctant to expend sufficient resources on evaluation and research studies. It is generally accepted that one per cent of any expenditure programme should be devoted to such endeavours. For North East Thames Regional Health Authority this would involve an annual expenditure of £8 million: it is unlikely that present expenditure exceeds £1 million.

Memorandum by the North West Thames Regional Health Authority

1. This response has been prepared by a Working Group of the Regional University Liaison Committee (RULC) including representatives of Charing Cross/Westminster and St Mary's Medical Schools, the Royal Post Graduate Medical School, the Cardiothoracic Institute, the University of London and the Regional Health Authority and Paddington & North Kensington and Riverside Health Authorities. We welcome the establishment of this Sub-Committee, as in a time of limited resources, but apparently unlimited ideas, the establishment of priority areas in medical research is of crucial importance.

2. Members attended the meeting sponsored by the University Hospitals Association in October 1986, where the following points were accepted as of major importance:

2.1 The traditional, reciprocal relationship between the NHS and the Universities in medical research is under pressure because of:

(a) the current reduction of academic posts (both medical and non-medical)

(b) the reduction and redistribution of junior medical posts by JPAC, and the threat posed to joint research/clinical posts funded by soft money

(c) the imbalance of research programmes caused by increased dependence on medical charities

(d) the impact of increased bed throughput on established patterns of teaching and research

(e) the lack of assured NHS/academic pay parity.

2.2 The pressure on UGC funding has been increased by the need to allocate resources to provide for new growth areas within the undergraduate curriculum, such as general practice and the social sciences.

2.3 Molecular biology and genetics illustrate the problems for the NHS in accommodating the impact of new areas of research. This is an example of an area in which, if research findings were applied, there would be a range of new opportunities for the prevention and treatment of a wide range of genetic and multifactorial disorders.

2.4 It was noted that today, unlike previously, our biomedical academic system fails to identify (and provide with resources) a number of focal centres of excellence in research, often built around particular outstanding individuals. This failure is contributed to by the conflicting demands of the medical career structure and the accreditation requirements of the Colleges and Faculties, the smallness of many academic departments, and the increasing difficulty experienced by young persons of excellence in obtaining early and adequate funding for research.

3. Medical research covers a range of qualitatively different activities, and it is important to define and clarify these:

— *basic medical research* which is described perhaps most appositely as speculative. Here, the outcome of a research proposal or programme is by definition unpredictable, yet it is this area of research in which many of the most important developments are achieved. For speculative research to be effective several criteria must be met including: first, the research unit must be of a sufficient size to manage a valid research programme and to train and develop young scientists; second, it must be possible to identify, support and provide reasonable job security for young scientists with research potential; third, the funding institutions must be capable of recognising excellence and potential excellence in research

— *the evaluation of diagnostic, treatment and preventive interventions*—either individual activities such as a diagnostic test, a drug treatment, an operation or a screening test, or the implementation of care programmes such as the replacement of the large mental illness and mental handicap hospitals with locally based services, the development of multi-agency services for disabled people or a prevention programme to reduce coronary heart disease. This research spans a whole range of activities which at one end are closely related to basic medical research and thus have elements of

unpredictability, and at the other are interwoven with the planning and management of health services.

It is also necessary to recognise that, although research is undertaken primarily to enhance understanding, it also includes strong elements of education and training—inculcating a critical approach to data and information, providing a framework for problem-solving, encouraging young doctors and scientists to continue to learn throughout their careers and offering exposure to the stimulating environment of a research unit. These units must be able to train, therefore, not only those young graduates who will make research their career, but also those who will spend only a relatively brief time in research, but for whom this will be an important component of their training. There is also the need to encourage this latter group to maintain their interest in critically evaluating their area of clinical care, and to establish working links between them and the research units.

Four major types of funding can thus be identified:

(i) For basic medical research—here the emphasis must be on funding excellence, in the form of either an individual or a research programme. To a large extent funding will be determined opportunistically on the judgement of the relevant peer group, although this should be within a framework which recognises the public health priorities for research. Competition should be encouraged, as long as the outcome is complimentary rather than duplication.

(ii) For evaluating specific interventions and care programmes—decisions about funding will be more strongly influenced by externally-defined priorities. In some under-researched areas, action needs to be taken to enhance the quality of research proposals—for example, research into services for the priority care groups and health promotion programmes. More research is needed, but the calibre of the work must be improved. This implies a need to strengthen some existing research units and perhaps to establish new ones, to clarify priorities and objectives and to invest in training a cadre of new research staff.

(iii) For training—both future research staff and future practitioners, who need research experience as part of their training programme.

(iv) For maintaining research skills in those who, after some research experience, are now NHS employees. This requires a relatively small, but important, proportion of the overall research budget.

4. We shall respond to each of the questions posed by the Sub-committee.

(a) The decisions about funding medical research, and thus the implicit determination of priorities, are made on the basis of the interests of an individual or a research group interacting with the views of the major funding bodies—the Research Councils (especially the MRC), the NHS, the medical charities and industry. Directions of research will tend to follow the availability of funding.

We would argue that the criteria outlined in paragraph 3—excellence and expertise, national priorities and education and training requirements—should be the basis for decisions around priorities in medical research. The extent to which other factors supervene will affect adversely the quality of medical research, and this is perhaps particularly apparent when resources are constrained, and an increasing proportion derives from organisations, such as the medical charities and industry, with specific interests.

As a generalisation, we feel that too few resources are invested in health services research, with, as a consequence, a failure to assess adequately the outcome of modalities or programmes for prevention, diagnosis, treatment or care.

(b) It is very difficult to predict which areas of medical research will lead to the most significant advances. For instance, for many years molecular biology was regarded as esoteric and of little practical use, yet now it is the most rapidly advancing area of clinical science in many different spheres. Similarly, the advances in imaging, computerisation and material science rest upon fundamental research in engineering and metallurgy. Therefore, we would argue that priorities in basic medical research (that is, which research is to be funded most generously) should be determined as at present, by diligent peer review through the MRC and analagous committees of the charitable bodies, but with a greater appreciation of the overall needs of the public's health. As discussed in paragraph 3 competition will enhance the quality of research, only so long as limited resources are not divided among too many small units leading to poorer quality research and duplication. Peer review, combined with the high cost of research, ensures that new projects which complement those already underway in existing groups are funded only for good reasons—either when there is a lack of confidence in the existing findings, or when the project is of such breadth and importance that there is room for more than one approach to a problem.

The evaluation of different methods of care is a generally under-researched area. This has resulted not only from the fact that the interests of the majority of medical researchers lie in

basic medical research and acute care, but also from the relatively poorer quality of research workers in other areas. Examples include mental health, services for elderly people, physical and mental handicap and primary health care. The interaction of social factors, such as culture, race, gender and deprivation, and health also need further study. Sustained and carefully directed funding is required to establish and nurture research in these areas.

(c) Priorities in medical research do adapt over time, partly as younger persons come into a field and acquire responsibility and resources. By definition, it is easier to set up a new group which adapts to changing needs and technology than to change the thoughts and practices of existing groups. In our view, the most serious problem of the present limitation of resources is that, both objectively and subjectively, younger clinicians and scientists are being starved of funds and opportunities. A whole generaion must therefore remain without the opportunity to develop research programmes or leave the country for other places, particularly the United States, where generous resources for young research workers are available. The consequences for medical research in this country are obvious.

Whilst this process of adaptation can be facilitated, it is essential that it occurs within a framework which influences research priorities in the context of health care needs. This requires effective collaboration between NHS staff and funding organisations.

(d) In some areas, and perhaps cancer research is the paradigm, a significant proportion of the resources for research come from the charitable sector. In other areas, such as research on new therapeutic agents, industry plays a key role. There is at present no mechanism for discussing the priorities of these agencies with the Research Councils or the NHS, and a real danger, therefore, of priorities being distorted. Co-ordination is essential.

There are particular problems for health services research which is unlikely to attract funding from the commercial sector and thus is in danger of becoming even further relatively underfunded.

(e) The results of research are usually published quickly and known widely through refereed journals. However, much more than this is required for the full implementation of the recommendations especially when changes in clinical practice are required. There is a remarkable time-lag between the demonstration of a clear need to modify clinical practice, and change in even the major centres of expertise let alone the more peripheral units. More work is needed in this area to understand the process of change and how it can be facilitated.

(f) Although duplication of research has always been a matter of concern to the funding bodies and the public, in our experience the non-productive duplication of research is a rare event. This is discussed in (b).

(g) As indicated in (e), this is not always the case. This is especially so when the research findings challenge existing patterns of clinical practice, where more attention needs to be paid to the process of achieving change.

(h) We welcome initiatives, such as those of the MRC and the Wellcome Trust, which provide the opportunity for a period of several years' research for "high flier" clinicians. However, we note that the proposals of JPAC, and "Achieving a Balance", could lead to an inflexibility within the training grades which will militate against clinicians entering biomedical research. We also note with dismay that the MRC has been forced to reduce the funds for students to read for intercalated BSc courses, surely an excellent way to attract able young doctors into a research career.

There are major problems in the entry of scientists into biomedical research. First, we are not training enough good scientists in the interdisciplinary fields such as bioengineering, molecular biology or health services research. Second, the salary structure for biomedical scientists is inflexible and not competitive with rates that can be obtained outside; even today, it is possible for the head of a research group at the age of 30 to earn only £12,500 per annum. Third, while we do not favour tenure at a very early age, there are few posts (with the exception of those offered by the Wellcome Trust) which give a measure of security and responsibility—a "rolling five year contract" rather than a one, two or three year contract with no security at all. As a result, many of the best young scientists with first degrees in biomedical sciences are not studying for PhDs at all, but are entering industry, the City or going abroad at a young age.

(i) Obviously, the problems discussed above will not be solved by money alone. However, we feel strongly that improvements cannot and will not take place unless there is more money made available, through both the UGC and especially the MRC. In particular, the present situation, where the MRG receives no guarantee that financial changes (such as pay rises) will be funded, leads to a very destructive situation, with no possibility of planning over even the medium term. Perhaps most important, there should be some degree of overall planning and integration between the DES, DHSS, MRC and the medical charities, to ensure that policies are consistent and supportive over a period of time.

5. The RHA with the RULC is exploring a number of ways in which the relationships between health needs, health care and research can be strengthened. For example, we are clarifying the role of the RHA in research, and defining research priorities for the RHA itself. We are particularly concerned to support the excellent research within the Region, to train young doctors and scientists in research and to extend the more traditional frontiers of research into the evaluation of health care and the implementation of change. We are also exploring the role of the Post-Graduate Medical Committee in the application of research findings. Other specific initiatives are taking place within the Region, and the Sub-Committee will receive details of these in other submissions.

6. Members of the RULC would be pleased to elaborate this response if the Sub-Committee so wishes.

April 1987

Additional Letter from the North West Thames Regional Health Authority

Thank you for your letter of 17 November 1987 asking for information about the use of management consultants and commercially commissioned management information within the Region including at District level. I am assuming that your interest is not confined to medical research. I can only answer your questions in relation to projects at Regional level, because District Health Authorities can commission projects from management consultants without reference to the RHA. I have therefore written to Chairmen of District Health Authorities for this information, but I hope you will understand that it may take a little while for this information to be received and collated.

The RHA has used management consultants for a number of projects. We are very much aware of the importance of using management consultants only when:

— there is no capacity in house to undertake the project: for example a project might need intensive activity over a short period by a larger number of people than are available in-house; or

— the project requires special skills and techniques which are not available in house.

We are also aware of the need to monitor and evaluate each project to ensure that value for money is obtained.

As to the cost of using management consultants (which can seem high) this has to be weighed up against the alternatives: which are either to employ more, and specialised, staff who are not necessary for the RHA's routine work or to undertake projects more slowly than is desirable. Both these alternatives would probably be expensive, and a poor use of resources, in the long term.

One example of the use of management consultants was the review of cancer treatment services which was carried out by a team of specialists supported by Coopers and Lybrand. This review will form the basis of regional planning for cancer services over the next few years.

Another example is the work Arthur Andersen are carrying out on behalf of the RHA on the development and implementation of an Information Technology strategy which will benefit hospitals within the Region through improving systems and information gathering. Much of the work undertaken therefore is relevant not only to the functions of the RHA but also to its constituent Districts.

A slightly different example is the reorganisation of our Estates Development Directorate last year. The Directorate is responsible for the Region's hospital building programme from the planning to commissioning stage. Work previously done by architects, quantity surveyors and structural engineers employed by the RHA is now put out to competitive tender, giving a recurrent saving on staff costs of approximately £1 million per annum.

In the past year the RHA has spent approximately £2.5 million on management consultants for a whole range of projects, though a significant proportion of this is recharged to Districts. This figure should also be put in the context of the RHA Headquarters total revenue budget of £14 million and of a total allocation to the Region of £780 million.

I do hope that you find this information helpful.

W R Doughty
Chairman

December 1987

Letter from the North Western Regional Health Authority

Thank you for your letter of 3 March asking for replies to questions raised by your Sub-Committee. Our answers are as follows referring to the paragraph letters detailed in your letter.

(a) Priorities are assigned by Regional Research Advisory Committee. It is axiomatic that all priorities reflect NHS needs, and are therefore a measure of excellence.

(b) Present balance about right and independent of resourcing level.

(c) Yes.

(d) Applicants are encouraged to tap all available external sources (public, commercial and charitable) as appropriate within the context of the NHS Locally Organised Research Scheme, and priorities reflect the Committee's view.

(e) Yes.

(f) By the use of external national assessors.

(g) So far as this is an objective within the LOR Code of Practice—Yes.

(h) Need for more Research Training Fellowships to provide both medical and non-medically qualified researchers with training in medical research methodology, and the provision of NHS tenure arrangements for the non-medically qualified worker such as the clinical chemist, medical physicist, clinical cytogeneticist etc.

(i) Lack of funding available for the application of research output, that is to pioneer and develop procedures and equipment.

John Page

April 1987

Additional letter from the North Western Regional Health Authority

In replying to your letter of 17 November 1987, I must first apologise for the delay. I was unable to forward the required information by mid-December as I have experienced some difficulty in obtaining this information from the various Districts within this Region.

Information was sought from each District to cover a period of the last five years. The information I have received so far indicates that a total sum in the North Western Region of £15,000 was spent over this period in regard to medical research.

John Page

January 1988

Letter from Dr F Nour-Eldin

I read with interest the note in this week's British Medical Journal regarding the Committee's enquiry.

May I mention that in my opinion, my career was "finished" abruptly on closure of my pathology laboratory by the DHSS, because of my persistence since 1976 in trying to get the necessary people interested and a grant towards the preparation of a new blood fraction I discovered and known as BANA (Bridge anticoagulant neutralising agent). As mentioned to the Prime Minister, in a letter in 1983, it is my strong belief that had my new substance been given a pilot clinical trial and proven successful (already having been tested successfully on my behalf in the USA on haemophilic dogs) the following main benefits would have accrued.

1. AIDS in haemophilic patients would not have been as rife as it is now.

2. The Blood Products Laboratory, Elstree, would have become self-sufficient within a very short period, thus eliminating imports of infected blood fractions.

3. A saving of at least 5 million pounds per annum to the National Health Service.

4. Improved treatment and management for haemophilic patients especially those who have developed antibodies against the blood fraction (factor VIII) which is presently used in their treatment.

My prediction as mentioned to the Prime Minister in my letter and in my book in 1983 that AIDS will soon ravage haemophilic patients has sadly become only too true. At the time, I was utterly ignored and still am. In the past, I used to wonder why dedicated researchers and top scientists flock to America, but I now realise and understand their reasons, only too well.

Research workers may be divided into two groups. Those who carry out one or two investigations, usually confirming other people's work or gathering statistics from colleagues for the purpose of promotion or higher degrees; once obtained their research ceases. Serious and original research needs men of vision, courage and conviction. Accordingly, in my opinion, the provision of a *separate and specific career structure* for research workers is long overdue. This would give these special men and women their rightful status and would allow them to pursue their investigations wherever they wished without hindrance.

I was robbed of seven years of my contract as Consultant Clinical Pathologist because grants appear to be allocated only to certain favoured departments and establishments, no matter what. Investigations carried out in peripheral hospitals are frowned upon and considered of no value by the so-called "experts" who already have vested interest in distributing research funds available. They would not allow funds to be diverted for any reason from their chosen centres even if these centres are repeating other workers published work, a phenomenon common to many departments supported by the MRC and similar organisations charitable or governmental. One has only to open any scientific journal at random to verify this fact. In fact, many of the research grants received by some so-called research establishments or individuals are used for activities other than research.

One other point which might interest your Committee is the fact that rapid advancement in science has meant that on many occasions some or all members – even professors – find it difficult to understand or even fail to grasp the significance of some of the high-calibre and complicated projects. Some research workers conceive and can foresee ahead of their time. One also should appreciate that teaching and research do not necessarily go hand-in-hand, which makes it more the difficult for some committees to judge research from a written grant application only, which is the practice at the moment. I think that scientists should be given an opportunity to meet the respective committees which, no doubt, include laymen to fully explain in simple terms the significance of their new projects. Personally, I was denied this despite my many requests for a meeting following my discovery of the new blood fraction.

Nobody can deny that there is, and always will be, an element of professional jealousy. Most committees are formed from standard lists of names drawn from certain departments irrespective of their personal research achievements and sometimes irrespective of their knowledge of the subject under consideration. One cannot expect members of some of these committees to be entirely just when confronted with a new and very advanced concept which they are unable to discern.

I hope this information might be of some use to your Committee. I enclose for your persual a copy of the main part of my grant application to the MRC which was turned down despite the fact that I received a letter stating that the MRC Blood Transfusion Research Committee found my "preliminary findings promising and felt that there may be scope for further work on BANA" and in a subsequent communication it was stated that the Scientific and Technical Committee for the Central Blood Laboratories "endorsed the Blood Products Laboratory's offer of bench space and intermediate products" for me, subject to my obtaining financial support. This raises the question: Are the MRC and the DHSS to be trusted? My own experience shows clearly that every possible excuse was made to avoid helping me and every obstacle was placed in my way, culminating in my being unfairly dismissed from my post as Consultant Clinical Pathologist. Had I been in one of the ear-marked academic departments, no doubt a grant would have been arranged and given forthwith without any difficulty.

I think you will agree that this inequitable situation needs remedying in a suitable way as to encourage genuine and dedicated research workers and to treat them in a manner befitting their intellectual capabilities, rather than lose the younger ones to America or make them redundant, as I was.

August 1987

Additional letter from Dr F Nour-Eldin

Further to my letter of the 24 August, you will see from the attached article (*The Times* 11 September 1987) *(not printed)* that specialists (unnamed) "gave warnings more than 10 years ago that the service could not cope with the demand for blood clotting products to treat haemophiliacs". In fact, it was I who first pointed this out and offered a possible solution way back in 1976. This was completely ignored by various committees—some of which I feel sure included Dr Cash—who did not respond to my requests for a meeting to discuss this important matter.

Now, after 11 years, the truth is being admitted and actually claimed by artifice comments. It would have taken only three months to prepare my new material at the Blood Products Laboratory. This is just

one example of how a dedicated research worker with a new discovery for improved treatment for certain patients could be wrongly treated and hindered by some committees, where there is intellectual superficiality leading to inability to foresee the importance of projects entrusted to their judgement.

I am not quite sure as to the extent of the evidence required by the House of Lords Committee, and I do not wish to bother them unnecessarily. Nevertheless, I have some other points which are difficult to explain in a letter, but which in my opinion, have some bearing on medical research and research workers in this country. However, these topics may be itemised under the following headings:

1. Appointment of University Professors.
2. Appointment of Directors of Research Establishments and similar Centres.
3. Tenure of appointments—Professors and Consultants.
4. References and Referees in relation to research workers.
5. Names on medical and scientific publications.
6. Definition of Experts and Specialists.

If any of these points is of interest to the committee, I would be pleased to enlarge either by letter or in person.

September 1987

Letter from the Nuffield Foundation

Thank you for your letter of 3 March and invitation to submit evidence on the questions posed by the Sub-Committee. They are good questions but I do not feel able to provide adequate answers to them. Perhaps a brief account of the Foundation's involvement in medical research will explain why. We make grants of approximately £750,000 a year (less than 1 per cent of expenditure on research by members of the Association of Medical Research Charities) and most of that is spent on basic bio-medical research. £200,000 from a speical fund is spent on research related to rheumatism, and most of the rest through small starter grants and fellowships which are made in response to demand from researchers for aid which the universities find it increasingly difficult to provide from their own resources. We no longer make larger project grants of the kind made by the MRC, but make some larger grants for research and experiment in the provision of health services, especially in developing countries, and for subjects like medical ethics, which find difficulty in getting support elsewhere. We also make a number of grants for research on ageing, which is one of the Foundation's objects, and are contemplating support for a scheme of fellowships in geriatric medicine.

You will see from this that our activities are not directly in the mainstream of medical research and reflect a combination of our required objects (rheumatism, ageing) and our perception of the opportunities for a small funder (small responsive grants).

I should of course be ready to expand on these points if you thought it would be useful.

James Cornford
Director

March 1987

Memorandum from the Occupational Therapists and Physiotherapists Boards

Occupational Therapists (in relation to the Report on Civil R&D (1st Report 1986–87)

Chapter 7.3—Endorse the view that research and development in the UK are underfunded.

Chapter 7.4—Endorse the view that policies should be looked at horizontally—particularly relevant to applied and strategic research related to service, albeit frequently involving technology which currently "falls between two stools" and therefore has to acquire funding from Charitable bodies—if at all.

All recommendations relating to the closer working of various Research Councils must be commended—although we base this comment on common sense rather than knowledge.

The increased emphasis on Research and Development in industry and close links with higher education seem central to the stated aim of "acquiring new impetus"—(7.1).

PHYSIOTHERAPISTS

Question

(a) Medical Research is carried out under the auspices of a Medical Practitioner directly and the Physiotherapist works in conjunction—or indirectly when the Physiotherapist guides the programme. The funding can be from a public, private or charitable source—my comments tend to relate to the former.

Priorities are set in relation to health needs primarily and the NHS secondarily. They relate largely to problems in evaluating efficacy of treatment modules and to developing new modalities and practices.

(b) More emphasis should be given to studying efficacy in accepted practices alongside new developments. This should be so even if resources increased.

(c) Yes (by and large).

(d) Quite extensively—some research funded by charities is of doubtful long-term value and could be used to better effect in different areas, whereas commercial funding weights new developments to the detriment of older practices.

(e) On the whole—yes.

(f) By adequate dissemination of information regarding research taking place and results reported—there is a central information source for research in relation to Physiotherapy, although small projects undoubtedly duplicate each other.

(g) Yes, although dependent on the sensitivity of individual departments in responding to change.

(h) Encouragement that virtually everyone is capable of a research project of some sort—that it is not terribly difficult or impossible.

(i) Encouragement of local "Research" funds being made available at District level to initiate specific projects pertinent to the District.

April 1987

Memorandum by Dr Jan Pahl[1] and Dr Helen Mair,[2] Medway Health Authority

Our joint submission to the Sub-Committee is evidence of the successful research collaboration which has grown over the past few years between the Medway Health Authority and the University of Kent. The experience gained from this collaboration has developed our ideas about the setting of priorities in medical and health services research. In this note we outline some of those ideas, but would be very willing to discuss our submission in greater detail with the Sub-Committee if that were helpful.

BACKGROUND TO THE SUBMISSION

Medway has a reputation as a health district which takes research seriously and in which work carried out over the past few years has contributed to providing more effective and more efficient services for patients. The district Research Report for 1987 will list over 40 studies carried out in and for the district over the past six years. These range from substantial evaluative studies funded from national sources to modest enquiries carried out by people working within the health service. The district has recently formed a Research Group which will monitor the quality of research carried out locally and give advice and guidance to researchers. Experience has led to a pattern of working in which research is an integral part of district planning. Studies are developed collaboratively by researchers working closely with the appropriate unit mangement teams, while research results are fed back to planners and professionals to be incorporated into service development.

This pattern of working reflects two influences. Within the district there is a strong Department of Community Medicine which has for some years maintained a programme of research studies reflecting the needs of the district. In recent years this strength has been augmented by the development of close links with the University of Kent. In 1985 The Medway Health Authority funded a Senior Research Fellowship in the Health Services Research Unit at the University of Kent and so has gained access to the resources and expertise available within the university. The experience of the past few years leads us to make the following responses to the questions raised by the Sub-Committee.

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[2] Director of Corporate Planning and of Information, Research and Development, Medway Health Authority, District Headquarters, Medway Hospital, Windmill Road, Gillingham, Kent ME7 5NY.

(a) *Setting research priorities*

In considering how priorities are set there is an important distinction to be made between clinical research and health services research. For clinical research, investigating new drugs or procedures, the local context in which trials take place is largely irrelevant. However, research into developments in health services cannot ignore the existing pattern of services and the context in which research results will be implemented. This means that while clinical research can be nationally funded, organised and reported, health services research must take account of local conditions, even if the eventual results have national as well as local significance.

The disappearance of area health authorities has given more power and responsibility to districts. It is at district level that most important innovations in services are pioneered. Ideally such innovations should be properly evaluated, yet few districts have the knowledge or resources to do this. For example, the changes currently going on in services for mentally ill and mentally handicapped people must be a priority area for research. Yet the move to care in the community is being pursued much more enthusiastically in some districts than others. It is essential that research be developed to evaluate the success of different forms of community care, making comparisons both within and between districts.

Involving health districts in the setting of priorities for health services research could take various forms. District representation on regional research committees would help to ensure that those most closely in touch with service innovations were available to advise on the distribution of research funds. Some of the money currently allocated to research at national or regional levels could be made available locally, either directly or through a process of tendering on the part of districts or groups of districts. This would have the effect of increasing awareness of research at district levels and of producing research results which reflected the priorities of those responsible for providing services.

(b) *Dissemination of research results*

This is a very important question and one which has been seriously neglected in the past. One could divide the activity called research into three broad stages. The first stage involves devising and planning the study and seeking funds to support the work. During the second stage data is collected, analysed and written up. In the third stage the results are made available, probably to a variety of different audiences, in both spoken and written form. Substantial studies evaluating new developments in health care may continue to be disseminated for six or seven years after the ending of the grant which supported the second, data collection stage of the work.

The problem is that of the three stages outlined above, funding bodies normally support only the second. This did not matter in the days when experienced researchers could expect to move into tenured posts, so that during the dissemination phase of research their salaries and support costs were met from University Grants Committee or National Health Service funds. The reduction in tenured posts, and the near elimination of tenured research posts, means that there is now a large body of senior and experienced researchers on short term contracts. Within the universities, for example, 25 per cent of academic staff are now on fixed term contracts, mainly of two or three years in length: most of these are researchers.

This is having disastrous effects on dissemination. Funding bodies prefer to fund new work and are uninterested in supporting dissemination. The process of negotiating a research grant normally takes between one and two years. This means that a researcher who is half way through a three year contract is likely to be both working on the current study and also planning his or her next project. Inevitably, disseminating the previous project takes third place.

There are various ways in which dissemination could be fostered. Funding bodies could welcome or indeed invite applications for funds to support dissemination, especially where a project has been particularly successful. At the very least they could allow funds left over at the end of a project to be retained by the researcher to help towards the costs of dissemination. Those who employ researchers could allow for periods of study leave, or "dissemination leave", so removing the pressure to go on to new work and allowing what has been done already to be as fruitful as possible. At the moment the buck is being passed between those who fund research and those who employ researchers, with each side ignoring the responsibility for disssemination. It is essential that some way be found to provide adequate financial support for the stage of research without which all the rest is worthless.

Disseminating research results to those who have taken part in a study is an essential part of the research process. In the case of health services research the participants include staff and patients, as well as the Health Authority itself, both directly and indirectly through planning and management structures. In the past too little emphasis has been placed on the importance of continuing contact between researchers and the services and too few studies have assessed the success of changes initiated on the basis of previous research.

(c) *Are the results of research reflected in improvements in patient care?*

If they are not, there are various possible explanations. One reason may be that the researchers were not sufficiently aware of the constraints within which the health service works and of the difficulties which

face service providers. The effect of this sort of research is to produce results which cannot easily be translated into service improvements: this occurs, for example, in university-based research where there is insufficient knowledge of health care in practice. A second reason may be that the research itself was badly planned or badly carried out. This is particularly likely to occur when the work is carried out by people without training in research methods or access to advice about research, for example, by health service staff who seek to evaluate the treatment and care they provide. Thirdly, research results may not be reflected in improvements in patient care because of the lack of support for the dissemination and implementation phase.

The pattern of working which has been developed in Medway does something to overcome these problems and may provide a model for other districts. Setting up formal collaboration between universities and polytechnics and their local health authorities can be to the benefit of all concerned. The health authority can draw on the resources of the university, while the university can be confident that the work being carried out will address current issues. However, this sort of collaboration requires more than just goodwill. We suggest that health authorities and universities should consider establishing joint posts, where this has not already been done. Such a post should run for at least seven years, in order to enable the appointed person to carry out dissemination on a continuing basis. Posts should be linked to specific departments. Within the health authority this might be the Department of Community Medicine or of Information; in a university or polytechnic the most appropriate link might be with the Department of Social Policy, of Sociology or of Social Psychology, with a research unit concerned with health and welfare provision, or with a department carrying out relevant research in the physical sciences.

(d) *Training*

At the moment training is particularly problematic for research which demands a background in the social sciences, so this is an issue which affects health services research more than other types of medical research. The Economic and Social Research Council has been seriously damaged by recent cuts in its funding. For example, between 1985–86 and 1986–87 the budget of the Science and Engineering Research Council increased from £290 million to £316 million and the Medical Research Council budget from £122 million to £128 million, while the budget of the Economic and Social Research Council was held constant at £24 million. This means that the research council which traditionally has funded the majority of post-graduate training in the social sciences, and which has always been the least well-funded of all the councils, now has to make further reductions in its work. The effect is very noticeable in the universities, where there are now fewer British postgraduate students than at any time in the last twenty years. The effect on health services research may not be felt for a few years, but in the longer term there must be a decline in the calibre of research workers if the current trends in research council funding are not reversed.

It has to be said that the traditional social science PhD may not provide the ideal training for health services research, being too narrowly focused and too academic. We would suggest that a more appropriate training might follow the lines of the MSc in Social Research methods at the University of Surrey. This is a taught course which attracts about 12 full time and 25 part time students each year. A substantial proportion of the students are funded by the National Health Service through training budgets, and about a third of those who complete the course go on to work as professional researchers within the health service. The aims of the course are to train people with a social science background to carry out research in a policy context and to give health service staff the skills needed to plan and implement research. We suggest that health authorities at national, regional and district levels should give additional financial support to research training of this type.

Within the health service, departments of Community Medicine provide a base for training in service evaluation and for opportunities to acquire research experience. Each trainee in the specialty is required to undertake written studies of service developments and each holds a linked appointment with both an academic and a service department. The need for closer integration between academic and service departments of community medicine was well defined by the immediate past President of the Faculty of Community Medicine. It is important to foster this integration, which provides a broad base, within the health service, for a natural and continuing association with university departments.

April 1987

Letter from Oxford Regional Health Authority

In response to your letter of the 12 November 1987 to the Regional Chairman I would inform you that the scale of expenditure on management consultants in the Oxford Region has approximated to £150,000 over the past eighteen months. The majority of this expenditure has been applied to the costs of management consultants appointed to: Examine the running of one of the major medical units in the Oxfordshire District; Advise on the introduction of supra district cook/chill catering throughout the region; Investigate the use of computer applications within the Region.

It should be noted that this sum excludes payments to firms of private accountants who undertake internal audit services for Authorities within the Region and professional firms of architects, engineers and QS etc.

If you require any further information on this issue, please do not hesitate to contact me.

D G Edmundson
Regional Treasurer

December 1987

Letter from Professor M E Pembrey, Mothercare Department of Paediatric Genetics, Institute of Child Health, University of London

I understand that the Select Committee on Science and Technology have formed a sub-committee that is particularly concerned about medical research for the Health Services. I am writing to you because over the last few years I have been intimately involved in attempting to translate research in human gene mapping and recombinant DNA technology into services for patients and their families. I think the difficulties that are arising in bridging the gap between research programmes and an established NHS service represent a valuable lesson on where management could be more effective.

Over the last decade clinical genetic services have become established within the NHS based on Regional genetics centres. My Department of Paediatric Genetics, Institute of Child Health, is such a centre serving the North East Thames Regional Health Authority and in particular the Hospital for Sick Children, Great Ormond Street, to which the Institute acts as a postgraduate medical school. In 1984 my department (together with Professor Harris' department in Manchester and Professor Harper's department in Cardiff) were selected by the DHSS for Special Medical Development (SMD) funding to develop a clinical genetic prediction service based on direct analysis of DNA for families with selected inherited diseases. At the time there were gene probes that allowed us to help families with haemophilia and Duchenne muscular dystrophy. We had the opportunity to tell female relatives more accurately than before whether they were carriers or not, and if they were carriers to offer a prenatal test as early as 10 weeks of pregnancy to discover if the fetus was an affected male or not. The initial SMD funding was for three years, and a condition of such funding was our cooperation with an independent evaluation of the impact of these new tests on genetic services by Professor Holland's department at St Thomas's Hospital Medical School. There have been dramatic research developments since 1984 and last year it became possible for the first time to offer accurate early prenantal diagnosis for cystic fibrosis (CF), the commonest life threatening genetic disease in our population. As one of the very few established units capable of applying these new techniques in the clinical setting and with the Hospital for Sick Children, Great Ormond Street, having over 200 families attending their CF clinic, it was clear that we had a responsibility to introduce and assess these tests. Indeed, this is precisely the situation that the independent evaluators needed to monitor in order to eventually advise the DHSS on policy for the application of these new techniques. Applications to the SMD for increased funding (£16,545 for 1986–87 and £38,680 for 1987–88) to cover these developments have just been refused after many months delay in responding. An urgent application last month to the charity, The Cystic Fibrosis Research Trust, has been turned down (see copy of their letter dated 11 June) (annexed). We are already heavily dependent on a two year grant (1987–88) from the charity, The Muscular Dystrophy Group, for continuation of our service.

Compared to many Regions, NETRHA takes an active interest in its genetic services and has agreed to fund from April 1988 that component of our work represented by families resident in the North East Thames Region, but this is only 50 per cent of our projected work in 1988. We cannot refer our hospital patients who happen to live elsewhere to other Regional genetic centres until they have established their own DNA analysis services over the next few years. Here we have an example of costly but often brilliantly successful basic research leading to options for couples at risk (which on present experience will lead to a reduction in the birth incidence of severely handicapping diseases that are costly to the NHS), a Region (in my case) that will play its part in integrating these applications into its health services, and yet complete mismanagement of the small amounts of development funds required to allow a smooth move from research to service. The final irony is that the independent evaluation funded by the DHSS has only really got underway in the last year and is planned to run for another two years, but there is currently no prospect of the existing services they are evaluating in the three centres continuing beyond the end of this year.

After a three-month stoppage (in which we risk losing our staff) we will run a skeleton service for our Regional cases from April 1988 onwards. The DHSS currently refuse to make any decision on our request to extend development funding for another two years to complete the evaluation and allow a reasonable time for Regions to take over the service. A recent letter from the DHSS states "For the later years (April 1988 onwards) no funds are available at present but financial decisions on the budget for 1988–89 are not

due to be taken until the autumn. In the lead up to that stage your application will be considered alongside many other development proposals seeking financial support". I do not regard delaying a decision to within two or three months of the closure of a clinical service employing highly qualified staff and involving couples planning pregnancies to be tested, as good management.

June 1987

Annexed letter from the Cystic Fibrosis Research Trust to Professor Pembrey

Professor Marcus E Pembrey,
Professor of Paediatric Genetics,
Mothercare Department of Paediatric Genetics,
Institute of Child Health,
30 Guildford Street, London WC1N 1EH.

Dear Professor Pembrey,

Your application for support was placed before the Meeting of our Research & Medical Advisory Committee on 3 June, but I regret they were not able to approve a grant to support your Laboratory as you had requested.

As you know we have already committed large sums to Manchester, Cardiff and Guy's Hospital for service needs and have rejected applications from Oxford, Newcastle and Leeds.

We are, in fact, going to contact the DHSS as we feel it is unsatisfactory for a charity to be faced with the responsibility of funding so many NHS patient services.

Barbara Bentley (Mrs)
Director

Memorandum by Professor J R Perrin and Mr R G Bevan, University of Exeter

COST AND FINANCE OF RESEARCH IN NHS HOSPITALS

1. Introduction

1.1 This note describes current arrangements for financing NHS hospitals with regard to the service costs of research. The difficulties of estimating these costs are described and appoaches which might identify them are outlined.

2. Finance of Teaching Hospitals

2.1 Financial allocations for English teaching hospitals are outcomes of a three-stage process: allocations by DHSS to Regional Health Authorities (RHAs); allocations by RHAs to teaching districts; and budgetary allocations within teaching districts to the teaching hospital unit(s) management. Whereas allocations by DHSS follow standard known rules, practices of RHAs and districts vary, and to our knowledge there is no up-to-date survey of what these practices are. We can therefore describe the former but only give impressions of the latter.

DHSS Policy

2.2 DHSS policy is to move RHA cash allocations towards RAWP target allocations. RAWP targets are mainly based on the estimated relative needs of resident populations. Adjustments are made for the estimated costs of: residents from one region treated in another; a few supra-regional services; and the extra services required to train undergraduate medical and dental students—the Service Increment For Teaching (SIFT).

2.3 The RAWP Report (DHSS, 1976) emphasised that SIFT is intended solely to cover the additional costs arising from the clinical training of medical and dental students. The method of estimating these costs was to identify excess costs at teaching hospital groups used by each medical school as compared with non-teaching hospitals. These total excess costs were divided by projected student numbers to produce an excess cost per student, by medical school. The starting point for deriving the SIFT rate per student was the median excess cost per student by medical school, which at the time lay between the London and King's College medical schools. The RAWP Report argued, however, that excess costs of the hospitals of these medical schools included an "excellence" element. It was decided to set the SIFT rate at 75 per cent of the median excess cost, broadly on grounds that it was not the proper function of SIFT to fund "excellence" (in patient care services, as distinct from teaching) but also because of findings of research

commissioned from the University of York (Culyer *et al*, 1978). The York research had explicitly excluded research costs from its analysis, because of the absence of comprehensive and accurate data on research activity (Culyer *et al*, 1981). (For a fuller account of the method see Bevan (1987a).)

2.4 The SIFT rate was revised by the Advisory Group on Resource Allocation (AGRA: DHSS, 1980) by using essentially the same method as RAWP on more recent data. The current SIFT rate is based on the AGRA estimate which has been revalued for inflation. In 1987–88 the SIFT rate was £27,000 per medical student. This probably exceeds the extra costs of teaching medical students (as RAWP intended), but it is unclear what these costs are and whether SIFT is needed to make good shortfalls in funding the basic services necessary to train medical students (Bevan, 1987b, Craig, 1987).

RHAs' policies

2.5 The RAWP Report recognised that as SIFT was intended solely to cover the additional service costs of undergraduate clinical teaching, the other reasons for the higher costs of teaching hospitals would have to be financed from other sources. These other reasons cited by the RAWP Report were: regional specialties, research and consequences of being "centres of excellence".

2.6 RHAs follow DHSS principles in determining DHA allocations. RHAs have their own ways of: estimating relative needs of populations; identifying regional specialties and giving these financial protection; and distributing SIFT between hospitals according to the scale of undergraduate teaching. So far as we know no RHA aims to finance the service costs of research directly. Although in practice it is difficult to draw clear distinctions between research, advanced medicine and teaching, the financial protection of regional specialties and undergraduate teaching is intended for these latter purposes only.

DHAs' policies

2.7 Typically teaching districts are those with the highest resource use of acute services in each Region. This means that under current policies of moving towards a more equitable allocation of resources, teaching districts are those required to reduce spending and teaching DHAs have to decide how this is to be done. As services other than acute are priorities (services for the mentally-ill, mentally-handicapped, children, elderly, and in the community), acute teaching hospitals tend to be under pressure. DHAs are mainly composed of local representatives whose concerns are to try to preserve services for local residents rather than services for other residents, teaching or research.

3. Estimating the Service Costs of Research

3.1 The NHS Management Board is currently reviewing the RAWP formula. Its initial Report (DHSS, 1986) considered policy options for funding the service costs of research and development, and recommended that this be funded to at least some extent through a mechanism similar to SIFT. At the time the Report was produced, however, this could not be implemented because no objective estimates were available for these costs.

3.2 The current review of RAWP follows an earlier exercise by the Advisory Group on Resource Allocation (AGRA). The AGRA Report (DHSS, 1980) recommended a study of the feasibility of estimating the costs of the different products of teaching hospitals (patient care, teaching and research) and Professor Perrin was commissioned to do this with a research team based at the University of Warwick.

3.3 The Warwick study examined the relevance of the theory of the costing of joint products to the nature of the problem of teaching hospitals given data routinely available. The study included examination of two teaching hospitals (St Thomas's and the Queen Elizabeth, Birmingham) where attempts were made to identify service costs arising from teaching and research (Copeman and Drummond, 1982).

3.4 The Warwick study concluded that given the state of available data in the NHS at that time (1982), it would not be feasible to assign costs of teaching hospitals to their different products (Perrin, 1987). The most appealing conceptual approach to identifying the costs of teaching and research, was to regard these as by-products, with the care of patients being the main product of teaching hospitals. To apply this approach it would be necessary to estimate what patient care ought to cost at each teaching hospital (as RAWP and AGRA aimed to do). This could not be done on any sound basis because NHS financial accounting systems within hospitals were organised to report costs by function (nursing, catering, pharmaceuticals and diagnostic services etc.) and not by type of patient (for example case-mix or diagnosis). Costs by patient were only distingusished by type of admission: inpatient, outpatient, and accident and emergency. Yet the mix of cases and thus the expected costs of treatment vary between hospitals within each type.

3.5 The initial report of the current Review of RAWP recommended using regression analysis to estimate variation in hospital costs by the following variables: costs of inputs due to market forces; costs of case-mix by specialty; additional costs at teaching hospitals due to undergraduate teaching, research and development, and the greater complexity of case-mix within specialties. It is hoped that this work will provide a basis for a revised SIFT.

3.6 The Report recognised that regression analysis may not produce significant results and recommended that the feasibility of detailed cost analysis in a sample of individual hospitals be considered in two or three years time, when improved Korner information will be available from NHS hospitals in the form of activity and cost data classified and analysed by specialty.

3.7 We believe, however, that given improvements in financial data and measures of case-mix, progress can be made now by detailed cost analysis in understanding the degree to which variations in hospital costs are likely to be due to differences in case-mix. Systems of reporting costs are being developed for new approaches to budgeting in NHS hospitals. This means that it ought to be possible to get better estimates of the extent to which differences in hospital costs are likely to be due to differences in case-mix.

3.8 We are planning to identify teaching costs by detailed analysis at two associated teaching hospitals which have recently begun to teach medical students by comparing costs before and after teaching began.

3.9 We are beginning an exploratory study which aims to assign costs of main teaching hospitals to their different products by identifying those functions which are typically significantly more expensive in these hospitals, and aiming to assign the costs of those functions in ways which reflect their primary purpose (specialised care, routine care, teaching and research). For example, it is reported that what tends to happen in these hospitals is that a diagnostic service is provided initially because it is essential for treating a small number of specialised cases, but once the service becomes available it is used on other routine cases. Now it may be that once the equipment has been bought and staffed so as to provide the vital service for the specialised cases which justify the establishment of the service, then the extra costs of tests for routine cases may be small. We aim to explore whether such distinctions can be made and reflected in costing, as opposed to conventional methods of costing which apportion all cost according to use. In this way we hope to develop a means of identifying the service costs of research.

Professor J R Perrin
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October 1987

Letter from the Pharmaceutical Society of Great Britain

Following receipt of your letter in March, the Council of the Society has given consideration to priorities in medical research. In submitting the following evidence the Council draws attention to the fact that members of the profession are to be found in universities, research laboratories, testing laboratories, hospitals and in community pharmacies. The word "medical" has been interpreted in the broadest sense and in light of the reference in your letter to basic and clinical research, health science research and research and development in the pharmaceutical and medical equipment industries, I respond to your specific questions accordingly.

(a) *How are the Priorities for Medical Research Set?*

Priorities are not clearly defined as no one agency has this overall responsibility. Priorities may be affected by available funds and a significant proportion of money for research is derived from charitable sources. Strategic planning and the setting of priorities are difficult when trying to gauge the availability of funds from charitable sources. This problem must be addressed if maximum benefit is to be gained from research activity.

(b) *Is the Present Balance Between Different Branches of Research Right?*

Funding for pharmacy from the research bodies MRC and SERC is considered to suffer because pharmaceutical research often falls between the disciplines represented by the two research councils. Hence the important potential contribution of fundamental and applied pharmaceutical research is not maximised.

(c) *Are Priorities in Medical Research Adapting to Changing Incidences of Disease etc?*

The Society is well aware of the shift in age of the population and of the inherent increasing concern with side effects of medicines in the elderly. This age group exhibits changes in metabolic processes, which have not been studied extensively. This subject could be studied to advantage within aspects of pharmaceutical formulation.

(d) *How are Priorities in Medical Research Influenced by Institutions through which Research is Funded?*

There is inevitable difficulty for a national policy to affect the direction of essential research when there is an increasing tendency to rely on funding derived from commercial and charitable sources.

The problem of balance in research is compounded by cuts in public funding to universities, polytechnics and the research councils. Cuts in real resources for research within universities and polytechnics have been evident since 1981, since when pharmacy departments in these institutions have needed to pursue commercial funding for research. Hence commercial influences could dictate the nature of research undertaken.

(e) *Are the Results of Research Adequately Disseminated?*

The Society believes that the present infrastructure for dissemination of resuits of research is appropriate. National and international symposia and a broad spectrum of published literature are well established in medical and pharmaceutical spheres.

However, it has become increasingly difficult for postgraduate students and some workers in research establishments to stand the expense of attending symposia and conferences. Also, considerable concern has been expressed at the diminution of funding for book and journal stocks in libraries and increased demand on existing computer facilities for information retrieval and accesses to computer-aided learning materials.

(f) *How is Unnecessary Duplication of Research Effort Avoided?*

A diversity of apporoach to particular problems may be beneficial and possibly competition between research teams could provide valuable stimulus. However, it is importnt to avoid unnecessary duplication of effort by good communication between competing research teams.

(g) *Is Research Reflected as it should be in Actual Improvements in Patient Care or Health Education?*

The profession of pharmacy has contributed to actual improvements in patient care primarily through the contribution of the pharmaceutical industry through the innovation of new medicines. There are some fields however, where that which is possible has not been adequately brought through to patient level. This is exemplified by wound healing treatments. Outstanding success rates have been achieved in hospitals but patients discharged to the community have been unable to continue their particular treatment because it has not been available through the family practitioner service. If emphasis is to be given to improving treatments of all kinds, the domiciliary service should not suffer due to false economy and false competition between hospital and family practitioner funding within the NHS.

With regard to health education and the potential for the involvement of community pharmacists, there is some doubt within the profession as to whether sufficient research has been carried out in this field.

Although acknowledging the value of health education, there is concern that more research should be carried out.

(h) *What Changes in Priorities in the Training of Medical Researchers are Needed?*

Again, the word medical is interpreted in the broadest sense to mean medical and pharmaceutical researchers.

The Society feels concern about the lack of security of employment for research staff particularly in government supported institutions. Undermining of staff through lack of security can and does lead to the loss of valuable and talented researchers.

There is a shortage of secondary school teachers to teach the science subjects which are essential to underpin medical research. These teachers require good, general science degrees and reinstatement of such degrees could help to improve the supply of these teachers.

(i) *Changes in Organisation or Funding?*

There is a broadly held opinion that the quantity of money available for research is woefully inadequate. Funding of the research councils is less than it needs to be.

It is felt that pharmaceutical research would benefit from better coverage of the interface between the SERC and the MRC plus greater recognition of applied research within those Councils.

The Council also wishes to make the following general points:

(i) Although the priorities of the Science and Technology Committee are given to medical research it is reassuring to note that that is elaborated to mean any aspect of the health of the nation.

(ii) The Society is in a particularly well placed position to comment as one of the prime functions of pharmacists is the safe and effective use of medicines. Unless appropriate research is undertaken medicines will not be either as safe or effective as they should be. There are certain areas of research which are not particularly viable for industry and it is on these that Government resources should be concentrated. These include the following:

Continued investigation in the physiology and biochemistry of animals and man to fill in the many gaps in our knowledge.

Investigation into the underlying causes of illness particularly those which are prevalent, life threatening or costly to treat.

Material sciences. Investigation should take place into the properties of new materials bearing in mind their behaviour during processing, their effect on such matters as bio-availability, stability and how these can be controlled.

Physiology of gastro-intestinal transit and absorption from the tract.

Factors affecting drug pharmacokinetics.

Patient to patient variability in response to drugs.

Novel materials which may ultimately have pharmaceutical application.

(iii) It is becoming increasingly difficult to develop medicines containing new drug substances and it takes on average about 12 years to generate the necessary data for a product licence application and the costs are on average between £50 million—£100 million per product. Work must certainly go on in this area but much more can be done at lower cost to increase the value of existing medicinal substances by improving the design of dosage forms and by enhancing the present methods of drug delivery. One research aim of value for example would be to improve the therapeutic performance of existing compounds by applying novel and more effective methods of controlled release. Site specific targetting would also be a major advance if small doses of active compound could be specifically directed towards a pharmacological site of action with a concomitant reduction in body loading and undesirable side effects.

(iv) The foregoing comments apply particularly to the need for research into medicines but there is also a need for research into the services provided in the subsequent supply chain. These include the following:

Community pharmacies are developing their services at a considerable rate and if the role as envisaged by the Nuffield Report into pharmacy is to come about this development will need to continue. Pharmacists more than any other profession have become involved in the use of computers. It is estimated that some 60 per cent have some form of computer system within their pharmacy. Such a facility does allow for greater economies within the business and greater efficiency and safeguards for patients by the maintenance of patient records and the flagging of adverse drug reactions. Research into the value of such equipment should

demonstrate the possibility of substantial savings to the health service. The report of the Nuffield Inquiry into pharmacy indicated that there was a dearth of research information within pharmacy. More could be undertaken to demonstrate the potential of community pharmacists as the front line professionals in the primary health care team whose services are readily available and economic to the state.

(v) It is commonly assumed that Health Education is an efficient means of achieving better health and whilst the Society subscribes to this there is a need for more research not only to prove this claim but to ensure that the latest results of medical research are applied and to ensure that the most efficient means of conveying information and advice are utilised. It is the Society's contention that pharmacists above all other health care professionals have a central role to play having, as they do, access to some 6 million persons per day who visit pharmacies in sickness and in health.

There are various professions involved in the provision of advice and information to patients and investigations should be made to ascertain the most valuable economical, and efficient source of advice.

I trust these comments from the Society will be a useful contribution to the deliberations of the Sub-Committee.

John Ferguson
Secretary and Registrar

May 1987

Letter from the Physiological Society

Thank you very much for your letter of 3 March which reached me via Professor Lamb.

I take it that in the first instance you do not want a large and detailed document with a great deal of factual data on the present position of basic-scientific and applied-physiological research in relation to the overall position of medical research but rather a summary of the present state of physiology in this Country relevant to your questions.

(a) Physiology is a fundamental Biological Science as well as being one of the Pre-Clinical sciences. It is unique in that it applies the reductionist analytical approach as well as an integrative approach to understand life processes in both man and animals. It encompasses a spectrum of scientific investigation which extends from the interaction between molecules in living systems, via the function and malfunction of the different body organs, to the integration of the different body systems in whole animal function. Physiological research consists of scientific investigations into normal function of living systems and the subsequent application of this knowledge to advance medical science for the comprehension, prevention and treatment of diseases in man and animals.

Both aspects are vital to the progress of medical research as evidenced by Comroe and Dripps in 1977. They showed that for our present ability to deal with cardiovascular and pulmonary disease the ratio of basic (research initiated with, at the time, little or no apparent medical relevance) to applied research was approximately 40:60. (*The top 10 clinical advances in cardiovascular pulmonary medicine and surgery 1945–75* US Government Printing Office, Washington DC). A further conclusion they made from their investigation was that there was an unpredictable time delay between the original basic advance and its subsequent application which varied between 5–20 years.

Thus in answer to your first question priorities for research can be partially set in the applied science but priorities for a real medical breakthrough will remain fairly serendipitous and will rely now, as in the past, on a cadre of highly trained researchers at the basic/applied interface capable of detecting and exploiting basic discoveries.

This pool of trained people is likely to diminish in the future since it depends, to a large extent, on medically qualified personnel who have:

(1) taken a year off from their medical studies to read for an intercalated degree in one of the pre-clinical sciences, or

(2) medically qualified personnel who receive post-graduate training in scientific methodology and analysis, or who combine their clinical commitments with investigative medicine, or

(3) on a supply of trained post-graduate basic scientists with a commitment to applying their discoveries in living systems.

The first will diminish since the MRC has initiated a policy of cutting its funding for intercalated students at a rate of some 10 per cent per annum over the next decade. The second will vanish because the financial reward, to medically qualified persons coming into basic sciences, is entirely negative and will depend more in the future on attracting scientifically trained personnel into the medical environment or on giving clinicians an adequate scientific training once recruited for, at best, a part-time scientific commitment.

The third is diminishing rapidly since high grade graduates are opting out of the academic sphere because their career prospects seem negligible in the climate of Government cuts in University finance, the morale of those employed in Universities is extraordinarily low and the scholarships offered are at, or near, the level of unemployment benefits.

(b) At the present time a major part of basic research is concentrated towards the molecular end of the physiological spectrum. This is for a variety of reasons including (i) the proportionately larger number of intellectually stimulating people working in this area (ii) it is exciting and fashionable (iii) the low recurrent cost for experiments (iv) the ease with which the young research worker can learn the techniques and (v) the rapidity with which the work can be performed and published.

For whole animal physiology Britain suffers from a relative loss of high quality people to the States not especially because of the personal financial rewards but because of the intellectual climate, the release from short term industry related work to keep their laboratories functioning and the ability to obtain funding to carry out their work with its considerably higher recurrent experimental costs plus the ability to build up a team of co-workers to carry out the complicated procedures involved.

Thus the student, in this country, is exposed to more and more of the advances made in molecular physiology and less to the whole animal aspect of physiology and is also seldom instructed in the relevance of the molecular to the physiological mechanisms in the whole animal. If the process continues then in the future the advances made in basic research at the molecular level will not be able to be applied at the whole animal level in basic or applied physiology.

In general the recurrent costs for whole animal physiological investigations has risen disproportionately in recent times. For example the recent Animal (Scientific Procedures) Act 1986 has made work on large mammals prohibitively expensive and hence research on the cardiovascular, respiratory, excretory and gastrointestinal systems is in danger of vanishing from Pre-Clinical Schools of Physiology with its consequent detriment to medical teaching, basic medical research and ultimately to advances in medical science *per se*.

Research which proposes to investigate the discoveries gained from molecular biology in the whole animal should be encouraged and funded preferentially regardless of an increase or decrease in resources.

(c) Physiological research has always been at the forefront of adopting new technology for animal experimentation. It was, for example, the first biological science to adopt valve amplification into its armoury and the first to use computers for experimental recording and data manipulation. An example of a physiological analogue computer is, in fact, on display in the Science Museum. Monoclonal antibodies and the techniques of gene expression are also routinely employed in physiological laboratories.

(d) Commercial funding of physiological research is only given if there is a definite short term return, that is to investigate the effects of a drug or to develop new instrumentation. Basic research is seldom funded. This could perhaps be encouraged if the Government were to give tax incentives to Commercial Organisations to fund such research.

The public bodies seek experts to sit on their Boards to form a peer review for funding but on the whole these are drawn from the molecular end of the spectrum with a consequent bias towards funding those aspects of science which they are competent to judge. In addition they seem to be going towards funding of centres of excellence and ignoring the lesson they appeared to have learnt in the 60's that research is concerned with creating a climate, whereby individuals and active groups are encouraged in their research, wherever they may be, and not necessarily in funding whole departments deemed to be centres of excellence. One aspect of funding in which the British took immense pride was the Programme Grant in which an individual, or group was funded over a period of some 5–10 years. This has almost vanished from the British scene and interestingly is becoming the adopted pattern for research funding in the USA.

The Charitable Foundations appear to fund persons rather than places so that they fund the whole spectrum of physiological research. Many Charities are indeed goal directed to the solution of particular diseases, for example the British Heart Foundation and the Cystic Fibrosis Trust to name but two. Nevertheless they do provide funding for basic research in their relevant areas. Funding by Charitable oranisations has shown a vast increase over the last decade as they have taken on the role of research funding properly that of Government.

(e) The Physiological Society holds nine Scientific Meetings per year at which new work is presented orally, by "poster" or by direct live demonstration. The Society publishes these as short (1 page) Communications in one of its two Journals. Dissemination of information is thus rapid for Communications (within 3–6 months) and within a mean time of 6 months for subsequent full publications.

(f) The question of duplication of research has always arisen. Repetition of experimental work is unavoidable to confirm an observation. Different research workers studying the same phenomenon will occasionally duplicate each others' experiments to see if they get the same result, this is also unavoidable. The right and proper concern over the use of animals in medical research resulted in the setting up of the Littlewood Committee (1965) which conducted a thorough study for the Home Office. They considered both these points and concluded that there was a small risk of unnecessary repetition of experiments and that the scale of duplication was not serious. Since that time computer technology has become readily available and literature searches are now competent and thorough. Since technology and knowledge is constantly changing, precise reduplication of experiments performed in the past is uncommon. Often the apparent reduplication of old research using new techniques uncovers new information which could never have been shown with the older techniques.

(g) Physiological research has enabled the development of organ transplantation, endocrine replacement, cardiovascular surgery and a large list of other advances.

(h) At the moment the priorities should be to reverse the trend of not funding medical students (in England) who wish to intercalate a year to study for a degree in their medical education and to ensure that sufficient funding of basic scientists (for equipment, consumables and Fellowships) is given to allow a nucleus of whole animal physiologists in all the primary systems (cardiovascular, respiratory, excretory, endocrine, neurophysiological and gastrointestinal) to be preserved both to initiate current research and perhaps more importantly to continue the training of both pre- and post-graduate medical and basic science students for future requirements.

One other very important source of scientific input to physiological research was the ability in the past to take graduate students from another scientific discipline, for example, physics, chemistry or engineering to train them in basic Physiology before they entered a research career in Physiology. The ability to fund such students either for a 2 year degree course leading to a BSc or a MSc has now become almost impossible.

(i) The Research Councils should be given more money so that they could fulfil their role more positively. For example the allocation of recurrent funds for post-graduate students should be project orientated. The Board's fees allocated to post-graduate students for whole animal physiology are grossly inadequate, they can for example only fund one experiment per year if the whole animal happens to be a large mammal.

The financial cut-backs in Physiology have led this medical science to crisis point. The young are opting out of academia and unless they can be attracted to stay there will be a shortfall of trained scientists within the next decade such that medical teaching and advance, and industrial advance, particularly in the pharmacological industry, will be destitute.

All of these points can be amplified and quantified should the Sub-Committee so wish.

Professor A Angel
Honorary Secretary

April 1987

Letter from Professor R G Priest, St Mary's Hospital Medical School, University of London

My attention has been drawn to your letter of 3 March 1987 inviting evidence for your Sub-Committee. I apologise for not meeting your original deadline, but I hope that what I have to say may still be of value.

I am head of a major clinical subject in this School. Academic departments of psychiatry have been founded relatively recently in the United Kingdom. Mine was founded in 1973. This has meant that, with successive cuts and an atmosphere of financial stringency in the university service, I have had little or no development in the UGC funded posts in my department since its foundation, and this is typical of several departments of psychiatry in this University. Thus the university side of the dual support system has been seriously lacking in this subject.

In the absence of a critical mass of research workers, we have found it difficult to attract more than a few major grants from the large funding bodies. Thus, though we have a wide range of interests, our research has taken the form of a series of low-budget projects. These have had some merit, have advanced both science and treatment, and have been published in the Lancet and other respected journals. Nevertheless the pattern of research has been stunted and distorted. You may wish to know that I have been carrying out research personally for over 25 years and I have served on grant-giving committees myself.

Answers to your nine specific questions follow.

(a) The priorities for medical research tend to be set by allocating funds to the testing of certain hypotheses. The hypotheses that attract funds have to have a certain eye-appeal and a face validity and need to convince the committee that they are likely to produce results.

Charities and other research grant giving bodies are understandably attracted to projects that are set up to test a very specific hypothesis, or to deal with an immediate pressing (for example clinical) problem. This is usually done by capitalising on research *methods* that have been developed over a period of years and decades.

What tends to get a low priority from the grant giving bodies is the building up of systematic programmes for the development of these methods themselves. Bids for money for this purpose are sometimes dismissed as "so-what?" research and certainly have less immediate eye appeal.

There are two subsidiary points that I should like to make. Firstly, this problem is exacerbated by the current tensions in the dual support system. Whereas UGC funded departments in the past could remedy this deficit, now they rely more and more on soft money directed at narrowly focussed hypotheses. Secondly, it is especially in new departments (such as my own) where this problem is most acute.

The health needs of the nation, and of the National Health Service, are thus not satisfactorily met. There is a great need for further research into mental disorders, which affect a large proportion of patients attending general practitioners, and affect patients in a high proportion of hospital beds.

(b) The present balance of research in medicine is not right. To some extent this point is made in my answer to (a) above. For the subject of psychiatry there is a further and possibly more subtle point.

Research in psychiatry lags a long way behind research in other branches of medicine for historical reasons. The leeway cannot be made up by concentrating on basic sciences themselves. Just as the major advances in medicine did not always depend on advances in physiology, so the advances in psychiatry will not necessarily be made on the basis of advances in neurophysiology or psychophysiology.

On the contrary, a large amount of work needs to be done at *the observational stage of scientific enquiry in the clinical sphere itself*. Work is already in progress on the establishment of laws that are obeyed by mental illness but much more needs to be done.

It is on the basis of this *fundamental clinical research* that advances can be made. This is not an argument in favour of the collection of lists, or data accumulation for its own sake. Rather it is an argument for the expansion of epidemiology, nosology, survey analysis, the development of psychometric tests, and the systematic study of mental illness by other methods that are repeatable, reliable and valid. Development of the methodology itself is urgently required. However, since it does not necessarily lead to early answers it is difficult to attract funds for this level of research.

(c) Priorities in research have not yet adapted to the change in emphasis of the health service. Whereas the NHS has attempted to give priority to neglected areas such as mental illness, mental handicap, drug dependence and disorders of behaviour, the research funding authorities have not undergone a similar change of attitude.

(d) See answer to (a) above.

(e) and (g) The results of psychiatric research could be disseminated better (for example to medical undergraduates) and reflected better in improvements in patient care or health education if there were more psychiatrists employed in academic posts. At present development in this direction is retarded.

(f) and (h) No comment.

(i) Better selection of priorities should ensure improved funding for "Cinderella" areas (see (c) above).

To summarise, I should like to suggest that there should be more systematic support of UGC funded departments than *ad hoc* research projects, and that in particular, areas that have been neglected in recent years should be selectively supported.

June 1987

Memorandum by the Public Health Laboratory Service

1. The Public Health Laboratory Service

The Public Health Laboratory Service (PHLS) is primarily concerned with the diagnosis, prevention and control of infections and communicable diseases in England and Wales. It is an essential part of the National Health Service and consists of a network of 52 Area and Regional (peripheral) Laboratories strategically distributed in hospitals throughout England and Wales, together with Central Public Health Laboratory (CPHL) and the Communicable Disease Surveillance Centre (CDSC), both at Colindale, North London, and the Centre for Applied Microbiology and Research (CAMR), at Porton Down, Wiltshire. The work of the Service is coordinated and administered by PHLS Headquarters, also sited at Colindale. Further details of the service and its activities are given in Appendix A.

2. PHLS Involvement with Research

2.1 The PHLS has considerable involvement with medical research, much of which is applied and developmental, mostly relating to the diagnosis, epidemiology and prevention of infections and communicable diseases.

2.2 Research is an essential activity for the PHLS. New infectious agents, for example causing AIDS, Legionnaire's disease, continue to be discovered by research workers, including those in the PHLS, and research is then necessary to develop the capacity to diagnose the corresponding diseases, work out their epidemiology and to develop preventive and control procedures. Equally, known infectious agents require study to improve their control. The research activities of the 52 PHLS area and regional laboratories also provides a reserve capacity which can readily be turned to practical ends in the face of outbreaks—and the PHLS is involved in the investigation of more than 7,000 outbreaks of infection each year.

2.3 The epidemiological work of the PHLS includes the surveillance of infections and vaccination programmes, and the borderline between "surveillance" and "research" is difficult to define. The routine collection of data upon which surveillance is based would not be considered as research, but the scrutiny and analysis of that data often reveals new findings and may therefore be regarded as research.

2.4 PHLS "strategic" research includes planned multi-centre studies on problems that have national significance. Such studies may involve CDSC, appropriate reference laboratories at CPHL and several peripheral laboratories. An example is the recent study of legionella bacteria in the water systems of buildings, which was made in order to provide a rational basis for preventive and control measures. The PHLS is uniquely organised to facilitate such studies.

2.5 Part of PHLS research is done in collaboration with doctors and medical scientists in universities, MRC centres, hospitals etc., and many of the epidemiological studies involve collaboration with community physicians and departments of environmental health.

2.6 PHLS funded research work is constantly threatened by the pressures of the laboratory diagnostic work to support acute patient care, the demands for which grows steadily and must be met. Similarly, epidemiological research is difficult to sustain against the demands of routine surveillance and outbreak investigation.

3. The Main Areas of PHLS Research

Briefly, these may be considered under four headings: Methodology, Epidemiology, Prevention and Therapy, although there is considerable overlap.

3.1 *Methodology*

.1 To develop diagnostic techniques and to improve them in respect of speed, accuracy, cost effectiveness.

.2 To develop or improve methods of identifying individual strains of bacteria and viruses for epidemiological studies.

.3 To meet new challenges, for example, AIDS, Legionellosis, new influenza viruses.

3.2 *Epidemiology*

.1 To establish the cause of outbreaks of illness, to implement appropriate control measures and to monitor their efficacy.

.2 To detect and explain changes in the epidemiology of infections (for example, meningitis in teenagers; salmonellosis in relation to new methods of animal husbandry or food processing), and to investigate the epidemiology of new infections so that preventive measures can be applied and their effects monitored.

.3 Vaccines. Assessment of safety and efficacy of existing, new and improved vaccines; surveillance of the population to determine groups at risk and to estimate "herd" immunity.

.4 To predict, often with the aid of mathematics, the course of epidemics and the effects of vaccination and other control measures.

3.3 *Prevention*

.1 To devise procedures to prevent transmission of infections.

.2 To develop vaccines (mainly at CAMR).

.3 To test the safety and effectiveness of such developments, both short and long term.

3.4 *Therapy*

.1 To develop therapuetic products (at CAMR).

.2 To test the effectiveness and safety of therapeutic products and procedures (for example, of new antibiotics and antimicrobial regimens).

3.5 Much of the research summarised above falls into the last three of the broad categories of R&D adopted by the Committee (strategic research, applied research, development). However, the PHLS is also engaged in basic research, particularly:

.1to gain an understanding of the pathogenesis of infections, including long-term consequences, for example of changes in the normal microbial flora of the body.

.2 to study immune responses to pathogens,

.3 to understand the genetic, biochemical and physical properties of microbes.

Basic research in the PHLS is mainly funded from research grants from the MRC and other bodies, and takes place particularly at the Central Public Health Laboratory (CPHL), Colindale and the Centre for Applied Microbiology and Research (CAMR), Porton Down.

4. The sub-committee's specific questions

4.1 *Question (a) Priorities*

Determination of priorities first depends on the *identification of needs*, which is done:

.1 *by individuals,* who are often experts in particular fields and are often best able to judge what is important and feasible.

.2 *by the need to respond to events* for example new vaccines, pathogens, epidemics and outbreaks, new antibiotics or new potential sources of food-poisoning.

.3 *by external bodies*, for example, DHSS and Ministers in annual accountability reviews and *ad hoc*; the MRC Committee on Development of Vaccines; the Joint Committee on Vaccination etc.

.4 *by PHLS committees* concerned with various infectious topics, and by peer "value for money" reviews of laboratories and units.

The needs identified by these means will often incorporate recommendations upon priorities, but the decisions upon priority are made at four levels: (i) laboratory Directors; (ii) the heads of the main PHLS Centres (CPHL, CDSC, CAMR); (iii) the Director of Service and his Management Team; (iv) the PHLS Board. A further, important influence is the success or otherwise of applications for research grants to, for example MRC, DHSS etc.

The decision making at these levels is supervised through annual reports, informal inspections, and the peer review system for reference laboratories and units.

4.2 *Question (a). How do priorities reflect NHS needs?*

.1 With certain provisos (see 4.2.2) PHLS priorities reflect NHS needs well, because: the staff of the PHLS work in the NHS and are familiar with its needs; most PHLS research is service-orientated; PHLS microbiologists and epidemiologists are able to bring their expertise in infection to their judgment of what is needed; and account is also taken of DHSS needs through close liaison with DHSS colleagues.

.2 There are, however, certain provisos which affect the claim in 4.2.1.

(i) Research will normally be concerned with what is perceived to be soluble.

(ii) PHLS research funds are small and under constant pressure from the demands of acute patient care and acute epidemiology (outbreak investigation). This factor heightens the need to prioritise research, but nowadays means that much work that should be done is not tackled.

(iii) Research grants are nowadays difficult to secure, as the MRC etc., have their own funding problems. The frustrating delays of the process are an added factor, especially where urgent work needs to be supported.

(iv) There is a shortage of good research workers in certain areas, for example virology, biotechnology.

(v) Just as research budgets are eroded by the demands of PHLS service work, so basic and long-term research funding is eroded by demands of short-term, applied research.

4.3 *Question (b). Balance between the different branches of PHLS Research.*

We believe that the balance is generally correct, except that greater support is needed for basic and longer-term projects. An example is the assessment of the duration of immunity given by a vaccine and of the immune responses upon which it depends, which may require study for more than 10 years. Resources for such work are difficult to sustain against the demands of acute problems.

4.4 *Question (c). Priority alterations in response to changes in disease and technology*

Changes in disease constantly influence PHLS research priorities (for example AIDS research has become our highest priority). Changes in technology certainly influence priorities, especially where they offer new approaches to previously intractable problems. Investment in major new technology (for example computing) is hampered by cash shortage and the annual cash-limits system.

4.5 *Question (d). Influence of funding bodies on research priorities*

The balance between public, commercial and charitable funding does not greatly influence priorities in PHLS research. Charitable funds in general and commercial funds in particular are linked to the interests of the organisations concerned. Such funding bodies can readily be approached when appropriate to support research work identified as necessary by the PHLS. However, bodies funding research often do not give high priority to projects at the borderline between "research" and for example surveillance or epidemiological studies of a pathogen.

4.6 *Question (e). Are the results of research adequately disseminated?*

Generally yes, including through reports to DHSS and MRC committees, and the PHLS Communicable Disease Report, which is produced weekly and distributed widely to some 5,000 interested persons, mainly in the NHS.

4.7 *Question (f). How is unnecessary duplication of research avoided?*

By attendance at scientific meetings, scrutiny of the literature, visits to and discussions with others working in the same field, participation in research committees, for example those of the MRC. Grant-giving bodies consult experts whose knowledge helps to avoid unnecessary funding of closely-related projects.

Some duplication is however inevitable and desirable. Two teams may approach the same problem in different ways and both contribute to the solution. Even if they adopt the same approach, the combined results may be more convincing than either on its own.

4.8 *Question (g). Is research reflected in actual patient care?*

This is the objective of PHLS research, provided the term patient care is also taken to mean *prevention* of illness in the healthy population. However (i) not all research, however well conceived, is successful; (ii) some PHLS research at CAMR relates primarily to the interests of the Department of Trade and Industry and the needs of British industry.

4.9 *Question (h). What changes in priorities are needed in training medical researchers?*

It may be helpful to relate this question to the categories of PHLS staff involved in R&D.

Medical microbiologists. These are doctors who specialise in microbiology. Their main professional qualification is Membership of the Royal College of Pathologists, which is a virtual prerequisite for consultant appointments. The prescribed training course includes little or no research training and young doctors studying pathology are often not able to devote time to research until they have passed the final examinations and are perhaps 32 years old, by which time they are looking for consultant appointments.

Medical epidemiologists. These are doctors who specialise in epidemiology, which in the PHLS is related to infectious disease. Similar considerations apply, although training requirements for the

appropriate higher qualification (Membership of the Faculty of Community Medicine of the Royal Colleges of Physicians) offers more encouragement to undertake research. Training in research is, however, haphazard and is available in only a proportion of training posts, for example, those associated with academic units or with the PHLS Communicable Disease Surveillance Centre. There are very few career posts in medical epidemiology.

Scientific grades. Post-first degree training in the United Kingdom, directed to a PhD, is good, but training posts are becoming fewer owing to financial restrictions at universities, research institutes etc. The post-doctoral career structure for scientists in the NHS is unsatisfactory in relation to research as it offers only limited scope for recognising research, which is not encouraged in the NHS. A career structure is needed to help in the recruitment of biologists, statisticians, non-medical epidemiologists etc. who can support NHS and PHLS research.

Medical laboratory scientific officer grades. A research approach, through projects, forms a valuable feature of the training for Fellowship of the Institute of Medical Laboratory Scientific Officers.

4.10 *Question (i). Specific changes in organisation or funding*

.1 DHSS and research funding bodies should be encouraged to recognise more fully the importance of strategic, applied and developmental research.

.2 Funding for managed programmes perceived as being in the national interest (as in the current MRC AIDS initiative) should be encouraged.

.3 There is a need to protect R&D funds in organisation like the PHLS, otherwise these funds are drawn into the demands of acute patient care—which eventually leaves the organisation unprepared for the future.

.4 Annual cash limit funding hampers investment in major items of equipment for research and can hinder purchase of "best buys".

.5 DHSS should provide greater support for studies which are needed by the DHSS but lie in the no-man's land between "research" and "surveillance" of infections and vaccines.

.6 Means should be found to cover the gap that now exists between research grants and the total cost of projects. The overhead and other support needed is difficult for the PHLS (and probably universities) to find in the financial climate of today.

.7 The search for research funds is today very time-consuming (grant applications require much preparation). Because funds are restricted there is a risk that adventurous projects are not funded.

April 1987

Appendix A

PHLS Functions and Objectives

The major objective of the Public Health Laboratory Service is to provide the most effective and efficient service possible for diagnosis, prevention and control of infectious communicable diseases in England and Wales. This objective is carried out by the detection of infection and infectious agents, epidemiological analysis, investigation of outbreaks, developments of strategies for prevention and control, and the provision of advice. A second main objective is that of income generation which mainly concerns the Centre for Applied Microbiology and Research, Porton Down, and is carried out by means of research and development directed to the sale of services and the development of commercial therapeutic, diagnostic and other products.

Legislative Background

In 1945 the Government decided to put the wartime Emergency Public Health Laboratory Service on a permanent footing as the Public Health Laboratory Service (PHLS). The Medical Research Council (MRC) agreed to continue administering it on behalf of the Ministry of Health. Section 17 of the NHS Act 1946 authorised the Minister to provide a bacteriological service for the control of infectious diseases.

The PHLS Act 1960 transferred responsibility for the Service from the MRC to a new PHLS Board, established as a statutory body capable of acting in its own right as an agent for the Minister of Health. The Act also transferred the staff from MRC employment to the Board, and transferred property from the MRC to the Ministry.

The NHS Act 1977 (Schedule 3) incorporated the PHLS Board. Part I defined the formal constitution of the Board and Part II dealt with staffing and financial provisions. The PHLS Act 1979 extended the Board's powers by allowing it to carry out "such other activities as in the Secretary of State's opinion can be conveniently carried out in conjunction with the Service". This legislation enabled the Board to assume

responsibility for the administration as a civil establishment of the former Microbiological Research Establishment of the Ministry of Defence at Porton Down, which the Board renamed the PHLS Centre for Applied Microbiology and Research (CAMR).

The PHLS is administered by a statutory Board closely analogous to a Special Health Authority, but financed from the central funds of the DHSS. It is an integral part of the NHS, and its responsibility extends over the whole of England and Wales. The staff of the PHLS are employed on NHS terms and conditions of service.

Organisation

The PHLS comprises 52 regional and area laboratories distributed throughout England and Wales (Figure 1), and 24 reference and special laboratories or units, most of which are grouped in the Central Public Health Laboratory (CPHL) in Colindale, or at CAMR, Porton Down. The Service is administered from the Board's Headquarters at Colindale, where the PHLS Communicable Disease Surveillance Centre (CDSC) is also situated. Cost of the regional and area laboratories, which in addition to their PHLS work provide microbiological services for their local hospitals, are shared with the corresponding health authorities.

General Scope of the Service

The PHLS operates a network of centrally coordinated laboratories in accordance with its statutory obligations, primarily to provide a microbiological and epidemiological service for the diagnosis, control and prevention of infections and communicable diseases. The PHLS is also concerned, especially by means of the research and development work of CAMR, to develop applications of biotechnology—mainly, but not exclusively, in the health field.

Role of PHLS Laboratories

The functions of a PHLS area or regional laboratory are to provide:

1. Microbiological and epidemiological support for Medical Officers of Environment Health (MOsEH), Environmental Health Officers (EHOs), DHSS and others, and for clinical staff in hospitals or in the community, within the "PHLS catchment area" of the laboratory.

2. Full collaboration with the PHLS Headquarters and central reference and epidemiological facilities in the reporting and investigation of infections, control of outbreaks, assessment of vaccines, development of laboratory methods, etc.

3. Public health microbiology as required in its catchment area (for example, testing of food, milk, water, sanitary, environmental and outbreak specimens).

4. Access to virology diagnosis and advice.

5. The microbiological service, including Control of Infection Officer functions, to the District hospitals with which it is associated, and to general practitioners.

Although a number of these activities are carried out in NHS microbiology laboratories, which are concerned primarily with the service to their district hospitals, the five functions together serve to define the ways which distinguish PHLS laboratories. These can be summarised as commitment to public health and the control and prevention of infection and communicable disease in the population as a whole.

Epidemiology and Control of Infection. Through its CDSC, the PHLS collates information on the prevalence of infection, and when necessary the PHLS institutes special investigations into outbreaks and the epidemiology of particular infectious diseases. A major invaluable feature of the PHLS is its effectiveness in the face of outbreaks of infectious disease. The concerted efforts of microbiologists in peripheral and reference laboratories, together with the added epidemiological expertise of CDSC can and does act to prevent, investigate and control outbreaks of infection in the community and in hospitals. The regular reports of laboratory-proven infections received at CDSC from PHLS and hospital laboratories supplemented by other data, form a continuously changing up-to-date picture of communicable disease throughout the country. This is analysed and published weekly in the Communicable Disease Report, which is issued to microbiologists, community physicians and others concerned with disease control. In addition, through its CDSC, the PHLS coordinates the investigation and control of incidents of communicable disease of national importance and of outbreaks involving many local authorities.

Diagnostic microbiology. The regional and area PHLS laboratories are in, or closely associated with, District hospitals, and provide their clinical microbiological and infection control service. They also serve general practitioners, MOsEH, other doctors caring for communities and EHOs. The laboratories report to CDSC infections diagnosed from all these sources. By means of this continuous sampling at 52 different points throughout England and Wales, the PHLS monitors the infections which bring patients to hospitals or which attack them while they are there. The PHLS also becomes aware of the distribution of

communicable disease and its causative microbes in the community. All PHLS laboratories assist local hospital laboratories in the investigation of outbreaks of infections, if requested.

Surveillance of food and drink. All regional and area laboratories provide a microbiological service to the Environmental Health Departments of local authorities by examining water, milk and, increasingly, other food stuffs and environmental samples such as water from cooling towers. Imported foods are sampled at the port of entry or centre of distribution. Raw foods, in particular meat and poultry, and animal feeds known to spread agents of food poisoning, are monitored to trace the origin and transmission of these organisms. The survival or multiplication of food poisonong bacteria in foods is studied and, depending on the results, preventive measures are initiated. Both the Food Hygiene Laboratory and the Division of Enteric Pathogens, CPHL contribute substantially to this work. In the course of investigating outbreaks, laboratories are often required to examine foodstuffs and are always ready to advise manufacturers and distributors; but routine testing for commercial organisations is not ordinarily undertaken.

Surveillance of vaccination and immunisation. Evaluation of the effectiveness and safety of many of the immunisation programmes in current use falls to the PHLS Division of Epidemiology (of which the CDSC forms the main part), which also investigates new immunisation procedures. (Those relating to Hepatitis B are the separate responsibility of the Hepatitis B Epidemiology Unit).

Provision of reference and special facilities. Many PHLS laboratories carry out some of the more specialised tests needed for, diagnostic microbiology by neighbouring PHLS and NHS laboratories, and a number also provide a national reference service. The major back-up facilities are, provided by the reference laboratories or units which carry out various tests for the PHLS and for hospital laboratories throughout the UK. These tests usually require special expertise, techniques and facilities which it would be uneconomic or impossible to provide more widely. As well as carrying out special tests—such as the fingerprinting of microbes for epidemiological purposes—reference laboratories conduct research in their particular fields. This enhances the quality of the advice they are able to offer.

In the laboratories of CPHL and CAMR, the PHLS develops and produces certain therapeutic, prophylatic and diagnostic materials for use by the NHS and others, as well as itself. The PHLS also monitors some commercially available reagents and provides a range of test materials to its own and hospital laboratories to enable them to assess the quality of their diagnostic performance. The National Conference of Type Cultures (of bacteria of medical interest) has long been a constituent part of CPHL; more recently the European Collection of animal Cell Cultures has been established at CAMR, Porton Down.

Research and Development. PHLS laboratories engage in research, and several—especially the reference and special laboratories—have extensive research programmes. An element of research must feature in the work of all diagnostic laboratories if they are to develop cost-effective improvements in methods or introduce tests for newly-discovered pathogens, such as the AIDS virus. The successful investigation of outbreaks also frequently depends upon a research approach. PHLS laboratories also frequently join in collaborative investigations, for example, to evaluate new tests or to study the epidemiology of an infection. CAMR in particular has a substantial programme of research and development in the sciences underlying biotechnology processes and their application. The projects at CAMR are broadly of three kinds: in-house research, where the costs are a charge to PHLS funds; grant-supported research, where individual scientists have been awarded grants by bodies sponsoring research; and commissioned research, where the project is the subject of a contract with a commercial firm or other organisation. Commissioned research generates income (to the Exchequer), as may ultimately, some of the in-house projects—a process which the Distributorship and Marketing agreement concluded in 1985 with Porton Product should facilitate. The Service can, at short notice, call on the very wide range of knowledge and ability of its nationally distributed specialist staff. Working parties with appropriate skills can be formed to tackle new problems as they arise, so achieving the highest probability of producing speedy and useful results.

Acceptance of Specimens

The material examined in PHLS laboratories compromise clinical specimens (throat swabs, blood, faeces, etc.) from people suspected of suffering from microbial disease, or of being carriers of pathogenic microbes; and non-clinical (sanitary and environmental) specimens, such as food and water, submitted either as part of an epidemiological investigation or for public health surveillance. Acceptance of a specimen for examination is at the discretion of the laboratory Director. Normally, there is no charge for examination. Clinical specimens are dealt with only if submitted by medical practitioners, veterinarians, dentists or those acting directly on their behalf. Sanitary specimens can be submitted by MOsEH and EHOs (or members of their staff) acting on behalf of local authorities, or by others subject to the agreement of the laboratory Director.

The services of the reference and special laboratories are available to all PHLS, NHS and other official laboratories in the United Kingdom.

The reference and special laboratories receive specimens sent from other laboratories. Their services are available to all PHLS, NHS and other official laboratories in the United Kingdom.

The Advisory Role of the PHLS

The PHLS is often asked to advise central and local government and the hospital service on many aspects of infections and communicable diseases. Consultation is frequently initiated by the PHLS, whenever local observation or central analysis reveals an infectious problem that may require active study or intervention. The PHLS maintains close contact with veterinary organisations in areas of mutual interest, and collaborates with the World Health Organisation and with national laboratory and epidemiological services overseas. Particularly at CAMR, there is collaboration with commercial organisations on ways of applying microbiological expertise to industrial problems.

Prevention of Infections and Communicable Diseases

The various activities referred to above combine to form a strong national resource for the prevention of infections and their spread. The PHLS response to outbreaks allows the earliest implementation of intervention and control measures. Equally, the diagnostic surveillance activities, research and development, reference work and advisory work are all directed, not only to the diagnosis and treatment of infection but, more significantly in terms of national health, to disease prevention.

FIGURE 1

APPENDIX A

Letter from the Rehabilitation and Medical Research Trust

I am responding to your letter of 3 March addressed to the late Mr A R C Rowe, concerning priorities in medical research.

I write in my capacity as Chairman of the above Trust, and my credentials for taking a somewhat wider view are listed below.

My own involvement in medical research has been in the field of rheumatology and the disordered physiology of joints affected by arthritis, but my experience of medical research funding and funding policy arises from my current or previous positions with the following organisations and charities:

Arthritis and Rheumatism Council for Research
(Hon Medical Secretary)
Bath Institute for Rheumatic Diseases
(Chairman)
Research Institute for the Care of the Elderly
(Chairman)
National Osteoporosis Society
(Chairman)
Pagets Disease Society
(Chairman of Scientific Advisory Committee)
National Ankylosing Spondylitis Society
(Vice President)

The Rehabilitation and Medical Research Trust was founded with the late Dr Philip Nichols when he and I were Consultant Advisors to the DHSS in Rehabilitation and Rheumatism respectively, with the late Commander A R C Rowe as Director.

The purpose of the Trust was and is to support areas of medical endeavour where decisions and choices had to be made on the basis of informed enquiry, but where classical double-blind random allocation to alternative treatments or policies was impossible.

In the event, the Trust found its work mainly in the following fields:

(1) Housing and gardening for the disabled.

(2) The evolution of speech therapy into modern communication therapy for the speech disabled.

(3) Helping disease-specific self-help societies to get started and become independent.

(4) "Pump priming" finance for projects and pilot studies in the fields of rehabilitation and disabling diseases.

As such, the Trust has found a useful niche in the range of medical charities.

Perspective

Thus, this submission is written from the standpoint of the non-communicable acquired and inherited chronic disabling diseases such as arthritis, stroke and osteogenesis imperfecta with special reference to exploring the extent to which sufferers and their families can help themselves.

From this perspective, the acute communicable diseases, including HIV infection (AIDS) do not present such a challenge. As with Hepatitis B, Herpes and poliomyelitis they are, although dramatic and threatening, likely to be conquered by extensions of present knowledge of disease control and prevention.

Rheumatoid Arthritis

Of the non communicable diseases rheumatoid arthritis is seen as the greatest, single, well defined medical disease for which neither cause, prevention or effective treatment is known. Heart disease and cancers may be more common, but they are now known to be multiple conditions, while rheumatoid arthritis remains a single well defined entity. That it may be susceptible to cure and prevention is shown by the virtual disappearance in our life time of the similar disease rheumatic fever—a disease which used to affect 80,000 a year in the United Kingdom in the days when it was notifiable. Hopes were raised in the early 1970s when the genetic bases for susceptibility to chronic inflammatory rheumatic diseases began to be discovered (HLA B27 for Ankylosing Spondylitis and related conditions, HLA DR4 for rheumatoid arthritis and variants). But these genetic markers are not exclusively present nor have they yet led to the precipiting causes and prevention of these diseases. Research at St Thomas Hospital (Prof Dumonde) has demonstrated virus like parasites in rheumatoid arthritis tissue, but whether these are causing the trouble or are secondary invaders or "passengers" is still not known. But this clearly needs support and follow-

up. All the other evidence seems to point to an infective "trigger" which sets off rheumatoid arthritis in susceptible individuals.

In view of the severity, chronocity and frequency of rheumatoid arthritis (estimated at 1 in 30 adult women, less in men) the search for and proof of an infective cause for this disease must have high priority. An extension of this is the need to identify an infective trigger in the precipitation of ankylosing spondylitis, which affects about 1 in 100 men. Here there are the examples of post-Yesinia Enterocolitica arthritis and post-dysenteric arthritis, where we know the infective trigger, and we know the susceptibility factor. This gives a strong probability that infective precipitating cause or causes can be found in these other chronic arthritic diseases, with a much better possibility of prevention.

Osteoporosis

This is not a single disease, but the outcome of many processes including ageing. It is more common in women than men and with the increasing numbers of the elderly it has become a major health hazard and a burden on the National Health Service.

The two main expressions of osteoporosis are:

(1) Spinal Osteoporosis, with collapsing vertebrae, back pain, and loss of height, leading to the "elderly hunchback" appearance.

(2) Fractures of limb bones after trival trauma, of which fractured neck or femur now accounts for occupancy of up to 20 per cent of all orthopaedic beds and carries a 10–25 per cent mortality rate in various centres.

The evidence available suggests osteoporosis can be prevented, but not cured once present and the priority now is to find out why bones lose calcium precociously, and to the point where they fail as structural supports for the body. The Medical Research Council identified osteoporosis as a priority area for research, but at the same time closed the Osteoporosis Research Unit in Leeds and the workers there have dispersed. However, other centres with fresh approaches are keen to look at the problems and will need support as rather more sophisticated techniques are deployed in its research.

Osteogenesis Imperfecta

Much rarer, but possibly shedding light on the osteoporosis problem and the group of inherited conditions causing "Brittle Bone" diseases or osteogenesis imperfecta.

These are some of the areas where, subject to availability of funds this Trust would give priority. It is realised that other non-communicable diseases, the cancers, the various forms of heart disease, strokes, road traffic accidents, alcoholism etc. also require research into prevention and treatment, but they already attract large funds. The problem is the delivery of the benefits of already available research to those who require it.

With regard to the specific questions (a) to (i) as in your letter of 3 March 1987 my comments are as follows:

(a) People research what interests them, or where they can see a possibility of advance.

(b) What interests them often depends in turn on those who trained them. Thus in Britain and the USA, research into rheumatic diseases has become overbalanced in favour of immunology as the young academic doctors follow their professors and in time obtain academic posts and pass on their interest to their trainees. However, natural correctives occur and fashions change as others come up against practical problems which are under researched.

In general, the less glamorous the research, (even if a problem is common) the less easy it is to get a project funded. Leg ulcers, incontinence, atopic dermatitis are examples of diseases which do cause distress and demand expensive health care, but attract relatively little support.

(c) In general, they do adapt, often rapidly.

(d) The Rothschild emphasis on customer-related research has probably gone too far. Long term fundamental, contemplative research requires a freedom from empirical pre-determined objectives and an atmosphere where personal and family security can be combined with scientific controversy and application. The general loss of security and tenure amongst basic medical scientists and universities and similar institutions has gone too far and some of the best such people are responding by emigrating.

(e) No. Hence the need for self-help and lobbying organisations which can ensure that the results of research are delivered to those who would benefit as quickly as possible. This may mean influencing public and professional education and the attitudes of local and central governmental bodies.

(f) No research is ever precisely duplicated. Some degree of overlap is desirable. Professional and scientific societies and their meetings soon identify to each other those working in the same field.

(g) As in (e). There is always room for improvement.

(h) The main change is in public recognition of the value of health-related research. At present medical research workers who discover how to prevent and cure diseases are much less well rewarded and regarded than those who merely treat disease.

The overwhelming need in the universities and research hospitals is for security of finance to support research.

The best researchers become professors and immediately they have to spend vast amounts of time raising funds from non-exchequer sources to support their staff. But with the latest squeeze, their troubles are not then over. Large charitable donations won on scientific merit are now regarded by many health and university authorities as "onerous benefactions" because of costs and overheads. Some institutes demand 40 per cent or more of any charitable research grant to support "overheads". This is surely wrong. It discourages charitable giving and restricts such gifts to long established "fat cat" institutions which have rich endowments—not a good way to encourage new ideas and attitudes.

A S J Dixon MD FRCP
Chairman

April 1987

Letter from Professor M J Rennie, Department of Physiology, University of Dundee

In response to your letter to the Secretary General of the CVCP dated 29 July 1987 I set out below some comments concerning my worries about support for medical research in the United Kingdom.

I am Professor of Physiology and Head of Department in the University of Dundee. Previously I was Wellcome Senior Lecturer in the Department of Medicine at University College London although I also had a part-time position as a tutor/counsellor in the Open University.

I presently have responsibility for the academic direction of the Department of Physiology including supervision of undergraduate and postgraduate teaching and I personally have substantial research interests both in the fundamental aspects of physiology and bio-chemistry, mostly studied in the test tube or in animal preparations as well as a substantial interest in clinical metabolic research carried out in studies of normal volunteers and patients. Since I was appointed in September 1983 the research income of our Department has risen from £12,000 per annum to about £250,000 per annum over the last two years. Of the students and clinical research fellows who I supervise personally two have been awarded the degree of PhD, two the degree of MD (one with commendation) and there are five PhD students and two clinical research fellows "in the pipeline". I am a member of the Editorial Board of the European Society of Clinical Investigation, the European Journal of Applied Physiology, Clinical Science, and Intensive Therapy & Clinical Monitoring. I think, therefore, that my evidence can be said to be based on considerable experience of teaching and research in the basic medical sciences and the application of such research to clinical problems of direct importance to health care delivery.

I must say that I am very deeply disturbed about the present circumstances of education and training of undergraduate students, the drop in morale of university teachers as a result of the wholly inappropriate cuts in university spending, the lack of suitably attractive postgraduate training opportunities for scientists and clinicians within academic medicine and the Health Service and the very bleak future for British biomedical research (and therefore eventually health care delivery in Britain) if something is not done to remedy the situation.

May I say first of all that my general analysis and suggested remedies concur very closely with those with which you may be familiar as a result of submissions by the Save British Science Campaign. Briefly, the size of the cake available to civilian research and development, including biomedical science, is too small in comparison with our competitors in other parts of the world, it is inappropriately small considering the wealth of the country and the necessary remedies are relatively inexpensive in comparison with substantial wastes within areas of the public spending budget. I might add a note of my own that the present system for the dispersement of research funds via the Research Councils and the aims of identifying excellence is not sufficiently well based upon objective criteria to give one confidence that research support is being distributed in the best possible way. The worst possible example of this was in the extremely amateurish way in which the UGC went about deciding a league table of research excellence. The Research

Councils do a better job than this but nevertheless they do not take sufficient account of modern techniques of assessing both input and output factors contributing to Departmental worth.

The specific areas which worry me most are:

(1) The possibility that the ABRC Report (Phillips Report) will have a major destructive effect upon the relatively small scale, but so far extremely successful, pattern of biomedical research.

(2) The lack of adequate monetary remuneration for postgraduate students and the subsequent lack of a proper career structure for postdoctoral scientists in the Health Service and universities which very markedly inhibit entry of good graduates to the field and

(3) The lack of a proper system to enable medical graduates to undertake a period of clinically appropriate research in basic biomedical sciences without causing severe financial disadvantage to themselves and possibly even jeopardising their timely advancement in a clinical career.

I find the Phillips Report deeply disturbing. It seems to me that it is not appropriate to use a model derived from an examination of the big science and particularly the Earth Sciences in consideration of the funding structure for the rest of British science. Furthermore it seems to me that it is unlikely to be the case that judgments concerning excellence will be made on objective grounds and indeed it is explicitly stated in the Report that very often judgements will have to be made on grounds which basically rest upon the experience of a Panel of experts. Basically what this means is that those who do *best* under the present system will continue to do well, those who do worst will get nothing, and the rest of us, who are somewhere in the middle, will have our ability to continue to do what we hope is high value research at low to medium cost severely compromised. Furthermore the division of universities into so-called R, X and T types will rigidly fix the distribution of funds in such a way that no young scientist or clinician not already in an R type university would think of entering a T or X university at the beginning of a career. There would be no future. Flexibility is an absolute essential for the building of a healthy civilian research system and making once and for all judgments about excellence will lead to monolithic mediocrity in the medium and long term. Two supporting examples spring to mind: the excellence of the work of Sir James Black in producing not only propranolol for ICI but also the H_2 blockers for Smith Kline & French after an early career in a university which was thought to be undistinguished and secondly the late Professor Peter Baker in coming from what might be regarded as a laboratory of international renown, in Cambridge where he worked with Sir Alan Hodgkin to the rundown Department at Kings College London, subsequently transformed into one recognised by the UGC as being of star-status.

The future for the development of postgraduate research and postdoctoral research is presently extremely bleak. My department is rather a small one with only eight members of University-supported academic staff, which has not in the last 5 years received a studentship from the Medical Research Council. This is because, firstly, there are few studentships to go round, and secondly because with so few available it is said to be necessary to apply very high standards in choosing suitable departments. These criteria include the so-called environment for research training, part of which depends upon departmental size. In other words a small excellent department is effectively discriminated against on the grounds that students will not see as wide a range of teaching and research expertise as they might in a bigger department. Personally I think this is a false analysis but it is the one underlying the present system. I find it particularly odd that despite not obtaining MRC quota award studentships we have successfully applied for studentships from the Wellcome Trust (2), the Joint Consultative Committee of the Milk Marketing Board (1), various commercial companies (2) and also have been supported by research scholarships from the University of Dundee (3). In addition this year we obtained two SERC studentships. Unfortunately we were only able to fill one of these. Enquiries among prospective students and among other members of the University research community revealed that the perception of graduates concerning academic research as a career was extremely poor. They well recognised the lack of support given by Government to the Universities and the research community, they saw the very poor salaries paid in comparison with industry or financial institutions, and they accurately perceived that the competition for secure jobs as University teachers was so intense that only a very small minority would be likely to succeed. Naturally, young graduates have decided to follow other options.

There are, luckily, substantial numbers of well qualified postdoctoral scientists working in biomedical science, supported on short term contracts. Without them it would be extremely difficult to enable high value, high quality research to continue but, and because of poor research prospects, many of these are deciding either to leave the country or to drop out of science altogether. I very nearly lost an excellent postdoctoral worker who had the opportunity to take over the running of his father's pharmacy business and one of my PhD students has emigrated to the United States where he is now paid, within two years of arriving, a salary higher than any non-professorial member of my department.

I have also been extremely lucky in managing to attract well motivated, well qualified clinicians at a relatively junior stage of their career into my research group in order to carry out human metabolic research. Nevertheless this is a very precarious venture for them. The difficulty is that unless they devote less than their full time to their research project, by keeping up their clinical links, and thus making it more difficult for them to do excellent basic science research, they are unable to compete with their peers

who may be of a lower calibre generally, when it comes to applying for Senior Registrar's posts. In many cases, NHS Consultants consider the holding of the MD or PhD degrees as being of less importance than another two years experience in a clinical setting. Of course this is a short term view which assumes an essentially static set of working practices uninfluenced by research-driven trends in health care delivery. Nevertheless this is the situation and there is no doubt that it results in financial sacrifice by the clinical research fellows concerned, a lower standard of research work by them than would otherwise be obtained and thus less value for money for the grant providing body and it produces pressures to identify the short-term, easily attainable research goals in order to be sure of acquiring an adequate amount of research information sufficient to ensure the award of a degree.

I would recommend that these problems be tackled in the following way. First, money needs to be thrown at the problem. The amount of money is not great in comparison with that spent in other areas of the research and development budget and a sum of £100–£200 million per annum applied to the development of research infrastructure in British universities would go a long way to repair the damage. This sum needs to be spent every year for at least five years.

Second, the status of postgraduate students needs to be increased, both in terms of monetary reward and by an overt recognition that they will be the professional researchers and academics of the future. This can only be done by setting up a proper career structure for scientists other than university teachers in universities and the Health Service.

Third, it may well be that a useful model for future postgraduate/postdoctoral education will include the provision of a stipend not only for three years of postgraduate study but the initial two years of post-doctoral study, with sufficient resources to provide running costs. The postdoctoral grant need not be held at the same Institution as the predoctoral.

So far as the training of academic clinical scientists is concerned, great effort needs to be put into two aspects. One is to obtain the agreement of the various speciality Colleges to recognise this kind of training as being a component of the training required by university teachers in clinical medicine, and of some NHS Consultants, and possibly to set up a new scheme whereby there was a "fast stream" of academically inclined medical graduates who would be provided with support, on a competitive basis, in order to take a PhD degree during the course of their early postgraduate career. If possible they would also be provided with support for independent clinical academic research to be undertaken in a clinical department rather than a basic science department after the award of their science-based degree. If this is not done Britain's present comfortable position as a producer of high grade clinical research will be lost and it will have a drastic effect upon the pharmaceutical industry and the health care equipment industry both at present major exporters. Furthermore it will have a very damaging effect upon the standard of health care delivery generally.

I would be very happy to provide any other information required by the Committee.

August 1987

Letter from the Research Council for Complementary Medicine

I write in response to your letter of March 17 requesting the submission of evidence of our organisation's involvement in medical research to the Sub-Committee under the chairmanship of Lord Nelson of Stafford.

The Research Council for Complementary Medicine was established just over three years ago in response to the rising public interest in complementary therapies and the "call" for some of them to be available through the NHS. In view of the absence of any existing legal requirement of previous training in, or formal accreditation of, any therapeutic practice other than orthodox scientific medicine, it stands to reason that some quality controls and ethical constraints need to be established in the area of complementary therapies in order to protect the public from exploitation.

It seemed to us axiomatic that valid judgements as to the potential benefit or hazard of any therapeutic system or technique can only be based on properly structured and critically implemented research and, therefore, it was virtually mandatory for such research to be mounted without delay.

The probability is that in due course, after proper quality controls and ethical constraints have been established, incorporation of at least the major complementary therapeutic systems into the NHS will result in substantial economies in certain areas, especially, but by no means exclusively, in geriatrics, and possibly also in paediatrics. This makes the implementation of research in this area all the more necessary and urgent.

Almost from the outset of the establishment of our Council it became apparent that three major difficulties existed in relation to research in this field:

(1) That very few complementary therapies possessed the experience or expertise to mount research of an adequate calibre for universal acceptance on an international basis, quite apart from the lack of both finance and facilities. This necessitated seeking the active participation and cooperation of hospitals and university centres in formulating and implementing research projects.

(2) No library or adequate data base, comparable with that available for research into orthodox scientific medicine, existed on which to base complementary therapy research.

(3) The standard double-blind control trial methodology was judged to have serious limitations in the field and the review of research methodologies as a whole seemed to be an essential preliminary research project in itself.

Over the past three years we have made substantial progress in all three areas. In the first we now have the active cooperation of four universities; Glasgow, Surrey, Belfast and Sheffield, and several major London teaching hospitals including Bart's, University College, Charing Cross and King's. On the second count, we have established the basis of a scientific information facility in conjunction with the British Library in the formation of a computerised data base. Thirdly, following on a series of internal seminars to discuss the whole problem of methodology, we have established a research fellowship in methodology in partnership with the Medical Research Council. The successful applicant, Dr David Taylor Reilly, holds qualifications in both medicine and homoeopathy and will be based in Glasgow University and work under the supervision of Professor Kennedy.

In addition, we have been involved in the implementation of a series of research projects of which several have been completed and published in the *Lancet, BMJ* and others (see separate sheet for references).

As regards the specific questions raised by the Sub-Committee, we feel that at the moment the priority for medical research is imbalanced in that it is almost exclusively concentrated on the analysis and management of disease, and that insufficient attention is being paid to the involvement of the individual patient with the experience of his illness and in the spontaneous processes involved in the restoration of health. The latter is all the more important since, in the past half century, there has been a dramatic reversal of the ratio between specific disease entities and non-specific illness in the community at large. Although research into the area of high technology remains essential, it is equally important to study on a more general basis the process of restoration of health and the place which many long-standing complementary therapeutic systems and techniques may have to play in this process.

Somewhat more detailed answers to your specific questions are listed below.

Answers to:

(a) Research in the field of complementary medicine is primarily aimed at obtaining evidence as to the validity, safety, relative efficacy and economy of the various different therapeutic systems and techniques with the long term view of their integration, where appropriate, with the existing NHS services. The priorities are as follows: (1) Clinical studies; (2) Demographic studies; (3) Direct studies aimed at elucidating the mechanisms of action.

(b) In our opinion, the present, almost exclusive, orientation of medical research towards the orthodox scientific method is greatly to the disadvantage of the overall needs of the nation.

(c) Publicity given to AIDS research suggests they are, but whether correctly is difficult to determine. More emotive causes probably cause disproportionate adaptation. Considering the rapidly changing average age of the population and, therefore, the growing burden of non-emotive degenerative disease, probably the adaptation is inadequate.

(d) Most organisations and institutions are not influenced by direct commercial interest, but leave the recipients of their donations to the discretion of the research team involved. Clearly, commercial and charitable funding is more likely to be channelled to those areas of research which are of special concern to donors—but not necessarily.

(e) Probably not. Although some papers are published in general journals, many are published in specialist journals and are therefore not seen by those in other disciplines, thus cross fertilisation of ideas is restricted. Considering the wealth of data, however, it is doubtful if it could be possible for all data to be universally available.

(f) By adequate literature search. Hence the importance of an adequate information resource facility such as the one which has been set up by the RCCM in the field of complementary medicine with the aid of a priming grant from the DHSS.

(g) Probably not—research, like advice, tends to be accepted when it confirms our prejudices. When it does not, the research is minutely examined for some flaw real or imagined whereby it might be ignored. Complementary medicine will have particular difficulties here on account of deeply held prejudice.

(h) Broadening their horizon to include the possibility of the substantial benefit to be derived from wider use of adequately validated methods presented by properly qualified and authenticated practitioners.

(i) Yes, greater recognition by both government and commercial organisations of the potential value of complementary therapeutic practices and greater reciprocal cooperation on behalf of hospital and academic centres in the implementation of the necessary research. We have achieved substantial progress in the latter field over the past three years.

We hope the information provided in this letter will prove to be of assistance to Lord Nelson's Sub-Committee.

Richard Tonkin

April 1987

Memorandum by Professor Osmund Reynolds, Neonatal Unit of University College Hospital

(Draft of an account given to Sub-Committee II of the Science and Technology Committee of the House of Lords during their visit to University College London on 2 April 1987).

Development of a clinical research programme

The Neonatal Unit at University College Hospital (UCH) is a regional referral centre for the intensive care of ill or vulnerable newborn babies. About 350 are admitted each year: in many cases, potential problems are identified before the baby is born, so that the mother can be transferred for delivery to UCH. The major group requiring intensive care are very preterm ("premature") babies. In the United Kingdom as a whole, about 650,000 babies are born each year, of whom about 2 per cent, or 13,000, need intensive care.

The concept and practice of intensive care for babies emerged in the nineteen sixties. At that time our major clinical research interests concerned the development and introduction of techniques for overcoming various influences, often arising from immaturity of organ systems, that can lead to death or permanent damage to the brain. For example, new methods were developed for mechanical ventilation with the aim of overcoming respiratory failure, a very common cause of death and damage. These methods were based on animal experimentation and also involved the development of new techniques for monitoring important variables, such as blood oxygen levels, in ill babies. To pursue these studies close links were built up and have continued between paediatricians working in the Neonatal Unit and numerous members of other departments at University College London (UCL) and UCH, notably the Departments of Physiology, Medical Physics and Bioengineering, and Obstetrics.

Outcome for babies who require intensive care

At the time when the intensive care of ill, and especially very small, babies began, it was generally thought that the result was likely to be the salvage of increasing numbers of seriously disabled individuals. The available literature gave handicap rates as high as 50 per cent in children who had weighed less than 1500g (31b 4oz) at birth, and many observers believed that these children had already sustained irreversible damage before birth, so that interventions afterwards would not be able to prevent the damage. Our view was a different one: namely that most of these babies were probably potentially normal individuals at birth but that they were very vulnerable to a range of adverse influences arising at or soon after delivery, which could kill or damage them, and for which preventive measures were becoming available. A programme of care was therefore introduced at UCH in 1966 which was designed to foresee and prevent potentially damaging influences. Respiratory difficulties have already been mentioned, but many other methods were also introduced then or shortly afterwards, notably total parental (intravenous) nutrition for babies who could not be adequately nourished orally.

We regarded it as mandatory to assess the outcome for the survivors, so a long-term follow-up study was started in 1966 and has continued ever since. Numerous publications have resulted which are in general reassuring about the outcome for very small babies and certain other categories of babies who require intensive care. For example, the rate of neurodevelopmental disability sufficient to interfere with a satisfactory life was about 11 per cent in babies weighing less than 1500g who had been born in 1966 to 1970; and only about half of the infants with disabilities could be regarded as seriously disabled. Since these results were obtained at a time when survival rates were increasing sharply, we concluded that it was possible to achieve both a high survival rate and a reasonably low rate of disability in the survivors.

A review of the world literature in 1981 showed that studies from other major centres, and also population studies, gave broadly similar results. It now seems clear that the major effect of the intensive care of newborn infants is to increase the chances of survival as normal individuals of many babies who in the past would have died or survived with disabilities. It is also clear that intensive care is responsible

for the salvage of a relatively small number of disabled individuals who in the past would probably have died.

Investigations of brain structure and function

Having found that the majority of babies requiring intensive care progressed normally in later childhood, but that a significant minority were disabled, we focussed our attention on developing methods for investigating, non-invasively, the structure and function of the brain in ill babies. We thought that if such methods were successful, it would become progressively more possible to achieve the major aim of intensive care, namely to provide the maximum chances of healthy survival for potentially normal individuals, but at minimum risk of salvaging hopelessly disabled ones. If objective methods were available for assessing the status of the brain, then it would be possible to investigate the prevalence and causes of brain-damaging lesions, to test preventive strategies and treatment, and also to assign prognosis—a major issue in any form of intensive care.

In 1978, we found that a good image of the brain in newborn infants could be obtained with portable ultrasound equipment. Since then, the brains of all very preterm infants (born at less than 33 weeks of gestation) and of other "high-risk" infants admitted to our unit have been examined with ultrasound. This technique has proved to be extremely useful for investigating the mechanisms leading to cerebral haemorrhage, which was already known to be an important cause of damage to the brain and of death in preterm infants. Some of these mechanisms have been reproduced in experimental animals and methods of prevention are now becoming securely based. Also, valuable prognostic information can be obtained from the results of ultrasound scans: for example, in a prospective study of 342 very preterm infants we found that 80 per cent of the infants could be assigned to a "low-risk" group, with only a 4 per cent chance of the later discovery of a serious neurodevelopmental disability; by contrast, 8 per cent of the infants had a very high probability of a disability—61 per cent, and the remaining 12 per cent of infants were at intermediate risk. Other techniques can be used, in the first days of life, to assess hearing and vision, so it is becoming possible to predict with some assurance what will be the later neurodevelopmental status of ill very preterm infants. There are three implications: firstly, strong reassurance can be given to the parents of a baby whose prognostic indices are good; secondly, when a disability, such as weakness of a limb, or deafness, can be foreseen with certainty, the earliest possible palliative treatment can be started; and thirdly, if it is apparent that the baby has no prospect of a meaningful life, consideration can be given, together with the parents and all those involved, as to how far intensive care should be pursued.

This study also provided strong evidence that hypoxic-ischaemic injury to the brain (injury due to inadequate oxygen supply) was the major cause of disability in surviving disabled very preterm babies—and not haemorrhage as had previously been suspected. Ultrasound scanning is an unsatisfactory method for investigating the early changes of this type of injury; we therefore sought new non-invasive methods for doing so. Another reason for wishing to explore the mechanisms of hypoxic-ischaemic injury was that birth-asphyxia in infants born at term is a more frequent cause of long term disability in the community than are the sequelae of preterm birth. With the help of colleagues in other departments, two methods have been applied to the study of this problem: magnetic resonance spectroscopy and near infra-red spectroscopy. Magnetic resonance spectroscopy enables oxygen-dependent metabolism in brain tissue to be investigated. The most exciting finding so far is that following a hypoxic-ischaemic episode, there is a latent period of many hours before the metabolism starts to deteriorate irreversibly, suggesting the possibility of effective early treatment. The data also provide strong prognostic information. Animal experiments are under way to mimic the situation found in the human infant, so that the most appropriate treatments can be identified. Magnetic resonance spectroscopy has, however, the disadvantage that the baby has to be transported to the spectrometer. Near infra-red spectroscopy is used to measure, in brain tissue, various indices of oxygen and blood supply; it provides continuous and instantaneous cotside information and shows great promise of being a major advance in the investigation and management of ill babies.

Collaboration within UCL and UCH, and relations with the NHS

None of the studies summarised above or the advances in the care of ill babies that have resulted could have taken place without the close collaborative links with other departments that were built up many years ago and have been nurtured ever since. For such a collaborative venture to be possible, a critical mass of expertise must exist within an institution, so that new or emerging problems can be tackled as they arise by contacts between experts in many fields who have overlapping knowledge and skills. The current trend towards the dismantling of certain major university centres with close ties with the NHS, such as has been apparent at UCL and UCH, is bound to cause adverse effects on the progress of clinical science. Particular difficulties have been encountered with the maintenance of the NHS-supported Neonatal Unit—which is the major regional referral centre for babies born in the North East Thames Region. Twelve out of the 34 available cots are closed because of lack of sufficient trained nurses, so admissions have to be limited. Several regionally approved and funded medical posts have been kept frozen at District level, for financial reasons, so research staff have had to carry much of the clinical load, thus curtailing their time for research. Also, partly because of the influence of RAWP, suggestions have been made in some administrative quarters that the unit should be moved closer to the regional "centre of population", at a District General Hospital in Essex. There are however strong arguments against this view: it is

extremely difficult to see how sophisticated neonatal intensive care, which is a highly specialised subject, could be carried out away from a major teaching hospital complex which contains all the different departments and round-the-clock supportive services that are necessary to make it a success. Further, the effects on research and teaching would be exceedingly adverse. At a more central level, the whole concept of regionalisation of neonatal intensive care (by way of three-tier structures within regions) which has emerged—for good reasons—over the past twenty years, is now somewhat under attack, on the grounds that most or all maternity units should undertake this type of care. Again, apart from the implications for teaching and research, there are strong counter-arguments. Too few very ill babies are born in most maternity hospitals to justify the full panoply of the necessary staff and facilities to carry out intensive care, quite apart from the cost.

Other impediments encountered to the continuing success of our research programme include the difficulty of attracting bright young clinicians to undertake research. Very unlike the situation in the past, joining a research group is these days often seen as disadvantageous to career prospects, partly because it may cause a delay in becoming accredited as fully trained. Also, there may be financial penalties; and competition for good NHS posts is perceived as likely to become more intense. A further problem has been the great difficulty encountered in obtaining appropriate honorary NHS appointments for junior medical staff while they are members of the research group, even though they are (as indicated above) undertaking much clinical work.

Funding

The paediatric staff involved in the programme of research have been almost entirely dependent on research grants, rather than UGC support. The only established post is a "New-Blood" lectureship acquired in 1984. Initial support (largely for work on mechanical ventilation) was provided by the Wellcome Trust. The follow-up study was originally funded by Birthright (Dr Ann Stewart, director of the study, and honorary senior lecturer and consultant, has now been supported by research grants for 20 years, no suitable University or NHS post having become available). Support in the 1970s was mainly from the MRC, DHSS, Wellcome Trust, and the National Fund for Research into Crippling Diseases. In 1981, the two latter charities, together with the Muscular Dystrophy Group and the Special Trustees of UCH provided money for a magnetic resonance spectrometer. Also in 1981, a five-year Programme Grant was awarded by the MRC which subsumed various other grants and provided support for the whole clinical team (eight full-time or part-time salaries for medical, professional and secretarial staff): this grant appeared to assure long-term stability for the group, but following negotiations (which began in 1984), for renewal in 1986, it was cut to four salaries. Extreme difficulty was then experienced in keeping the work going and holding the group together. Eventually, the DHSS provided support for three staff (another was, after very protracted negotiations, taken over as a regionally funded NHS perinatal pathologist). Security for the clinical team is now assured until 1991. Uncertainties about funding were, for a time, extremely disruptive to the progress of the work, but it is now progressing very well. Thought will, however, soon have to be given to raising support beyond 1991.

Financial support for members of other departments collaborating with the clinical team, notably in the Departments of Medical Physics and Bioengineering, and of Physiology, has generally come from a blend of UGC and grant sources. Lately, an application from the Medical Physics Department to the SERC for equipment for the development of near infra-red spectroscopy was highly rated but frozen, thereby causing unwelcome delays in a field where we appear to be leading.

Priority within research relevant to the NHS

Other areas of clinical research, for example the battle against AIDS, certainly rate a higher priority for research relevant to the NHS than does perinatal or neonatal research. The perinatal mortality rate in this country has fallen satisfactorily in recent years, though it still remains substantially higher than in certain Scandinavian countries. Also, we are aware that our own work is not very likely to lead to a major reduction in the overall number of handicapped children in the community. Congenital abnormalities (such as Down's syndrome) are responsible for about 75 per cent of these, and birth-asphyxiated babies and babies who are born preterm appear to be responsible for less than half of the remainder. Our aim is more to ensure that, as the survival rate of vulnerable babies who are admitted to neonatal intensive care units increases quite sharply, the survivors should be normal, not disabled, individuals. We believe that it is important not to be misled into thinking that money spent on neonatal intensive care and the related research activities would be better removed and spent on preventive programmes, for example against preterm birth. While primary prevention of perinatal death and damage through social and other interventions remains an extremely important goal, the numbers of vulnerable babies born each year in the United Kingdom are so far showing no signs of falling: for example, the proportion of low-birth-weight (less than 2500g) babies who are born in this country has remained almost constant at about 7 per cent of all births for over 20 years. Facilities must be provided for ensuring that these and other vulnerable babies are given the best chance of healthy survival. Perhaps reassuringly, it has recently been calculated (by an observer not connected with neonatal matters) that in terms of QALYs ("quality-adjusted life years"), neonatal intensive care is eight times more cost effective than are hip-replacement operations.

As a by-product of our work, we are able to provide for interested bodies, such as the DHSS, information about the outcome for babies who require intensive care that is relevant to the planning of services, and

is also relevant to issues of viability. Much of our research, too, has implications for adult medicine. For example, developments in magnetic resonance spectroscopy and near infra-red spectroscopy are likely to become highly applicable to the study and management of hypoxic-ischaemic forms of brain injury in adults, with implications for the monitoring of brain-oxygenation in a variety of clinical circumstances, such as incipient stroke, after accidental injuries and during surgery.

Letter from Colonel A C Roberts, Pro-Chancellor of the University of Leeds

I don't particularly feel qualified to comment on your letter, but hope my opinions are of some use to you.

There can be no doubt that the nation's health care priorities are the major preventable diseases of "civilised society" and the health inequalities demonstrated in the Black Report. There is abundant evidence from research that correction of these social inequalities and health education as regards cigarette smoking and diet will bring about a major reduction in mortality and morbidity from these conditions. Research is not needed here, but a serious effort on the part of the Government towards prevention.

Priorities for research are not set by health need, but by the facilities and opportunities to carry it out. Enthusiastic and gifted groups and individuals will push forward research in a particular sphere irrespective of the perceived "need" for such research. Equally, funding from, for example, a pharmaceutical company will enable research the aim of which is inevitably profit for that company rather than health needs. Hopefully, funding allocated by central agencies such as MRC is distributed according to health care priorities and the likely success of any project.

I am not aware of the distribution of public, commercial and charitable funding for medical research, but clearly such information is pertinent to the whole question of priorities.

I am sure results of research are adequately disseminated and where changes in patient care are suggested these are certainly being carried out. Such changes must be in the form of controlled trials or prospective studies in order to ascertain whether benefit has resulted. As I have already implied improvements in health education, however, do not match the conclusions of medical research.

Within my own field of Plastic and Reconstructive Surgery again the priority is prevention through health education. Skin cancers are the most common form of malignancy in this country and their incidence is increasing. Early detection offers the prospect of cure for almost all skin cancer. Comparison of United Kingdom melanoma mortality rates and tumour thickness at diagnosis with those of Australia and the USA demonstrates how far behind these countries we are in the sphere of educating patients to detect their own cancers. Burns prevention is another area in which Government action lags far behind research. Research in Plastic Surgery is directed towards mechanisms of healing and improvement of techniques. In order for any advances arising from this work to have beneficial effects it is essential that the availability of Plastic Surgical services to the general population is improved.

The establishment of a central coordinating body in each sphere of medical research would improve establishment of priorities, direction of research and allocation of resources; and avoid duplication of effort. I am sure that individual researchers could take part in such a scheme without sacrificing their independence or stifling their originality.

Thank you for the opportunity to comment on the letter, its tone implies that it expects hard "evidence" on the various points it raises. I fear however that such evidence in many instances does not exist, and the Sub-Committee will have to rely on a body of opinion instead.

April 1987

Memorandum by Professor A H R Rowe, Professor of Conservatory Dental Surgery, Guy's Hospital

Their Lordships have expressed interest in the reasons for the decline of the British Dental Trade and this paper will indicate why this has happened.

Before the last War the two firms of Claudius Ash, founded at the end of the last century, and the Dental Manufacturing Company (D M Co) produced most of the dental equipment used in this country. There were inevitably large exports to the British Empire. There was some small competition in this country from American manufacturers before the War from such firms as S S White and Ritter.

Ash's, D M Co and S S White also produced the majority of handpieces, dental hand instruments for conservative dentistry and oral surgery instruments. Ash's had a large factory at Walton on Thames where these things were made whilst D M Co had their main base at Blackpool.

After the War the situation remained unchanged for a period but then the Monopolies Commission became involved. The first report was an investigation into the Dental Trade[1] and the second into the proposed merger between the Amalgamated Dental Company (Claudius Ash) and the Dental Manufacturing Company.[2] These reports give a good insight into the position of the Dental Trade and Industry in the early 1950s.

The prime reasons for the apparent weakness of the United Kingdom manufacturing side of the dental trade were:

1. The restrictions imposed from the first investigations of the Monopolies Commission which discouraged the major dental companies in the UK from further expansion.

2. The explosion in dental companies world-wide after the War. What is now a major German firm (KaVo) started as a small business making handpieces in the Eastern part of Germany. Following the Russian occupation it moved to West Germany and by the entrepreneurial skills of one man has become one of the main manufacturers—exporting all over the world with large sales in this country. Other firms have started since the War and are located in Germany, Holland, Switzerland, Sweden, Finland, Italy, Japan and Taiwan. However the quantities involved in Dentistry are so small that in most fields one or two factories can supply world needs. This has caused enormous pressure on the firms world-wide in spite of the considerable world expansion in dentistry.

3. The structure of the General Dental Services of the NHS meant that the pressure was on volume production dentistry, using the cheapest materials possible. No dentist got paid more for using a quality product. Thus the type of products being produced for the United Kingdom market were not acceptable for any of the more sophisticated dental markets overseas. It should be remembered that the Dentist in this country, unlike the Doctor, gets no help from the Government for setting up and maintaining his practice.

4. The steady purchase by Amalgamated Dental Company over the years of a number of small producers and distributors of dental products in the field of instruments, forceps, waxes, equipment etc. meant that gradually the majority of British dental production ended up in the hands of either the Amalgamated Dental Company or the Dental Manufacturing Company. Then DMCo attempted to buy Amalgamated Dental—who fought off the bid with success, then DMCo (the Hawtin Brothers) decided to leave the Dental Industry and they sold out to Amalgamated Dental. The next stage was that Amalgamated Dental realised that there were several companies attempting to purchase them. They did not wish to be purchased by a non-dental pharmaceutical or chemical company and they sought refuge at their long-term American associates, Dentsply. Dentsply of USA bought Amalgamated Dental Company and proceeded over a number of years to rationalize the product range, which unfortunately meant that the manufacture of equipment and handpieces in this country was dropped. However, they have maintained a formidably strong instrument and forcep production and they sell these items world-wide. They have also kept a substantial tooth factory in Brighton, which is producing for worldwide markets and a chemical production unit at Weybridge, which is also producing on a substantial scale.

5. This has meant that world-wide there are only a comparatively few major producers of most dental lines.

6. Research and development: many of the dental developments in recent years have originated in the United Kingdom. Not unnaturally most of them were offered to Amalgamated Dental Company who were so committed that they were unable to exploit more than a few. The inevitable consequence was that as with so many other British ideas these dental developments have been taken on by other countries, particularly Germany.

7. Mistakes have been made at many levels. There was one British dental manufacturer (Plucknett) who believed in producing cheap copies of other people's products. The quality was just not good enough and they eventually closed. The Norman Rayne equipment production unit collapsed after the death of Mr Norman Rayne. It was then sold to an engineering company, who did not understand the dental business and closed. The Dental Fillings factory producing filling materials was sold to L Porro, who in turn sold out to Howmedica (who have just sold out again to Nobel-Pharma, a Swedish company). Companies like Amalgamated Dental, when they were producing equipment, also made some enormous mistakes in that they consulted with the wrong people, who

[1]The Monopolies and Restricted Practices Commission Report on the supply of dental goods printed 1st December 1950 (CODE NO. 18).

[2]The Monopolies Commission Report on the Proposed Mergers of Dental Mfg. Co. or Dentists Supply Co. of New York and Amalgamated Dental Co. ordered by the House of Commons, printed 9th August 1966 (CODE NO. 147).

encouraged them to produce equipment of the past instead of going for equipment of the future. The classic error occurred when a British company developed what was to be the prestige equipment of the 1960s. They took advice and finished up by building an enormously heavy and cumbersome piece of equipment which proved to be unreliable.

8. It is difficult now for a new company to break in to the equipment field. There are some substantial companies in Italy, such as Castellini, Eurodent and Anthos (plus several smaller producers), the major equipment manufacturer in Japan is Belmont, and the Germans with Siemens and KaVo. In the States the manufacture of dental equipment has virtually ceased, other than by ADEC. This is a most interesting company started by one man in the early 1970s with clever new simple technology which requires little maintenance. This company has virtually taken all the sales in the States and has substantial sales in this country. All the old companies with great names, such as S S White, Ritter, Chayes, Virginia and several others, have either disappeared or virtually disappeared.

9. The accountants and big financial people look at the dental business and do not really understand its small personal nature and are frightened off by the high level of service required for the very small sales. There are only 16,000 practising dentists working in 10,000 separate practices in the United Kingdom. Thus the market is tiny and there is considerable price and profit pressure on everyone.

10. Several large multinational companies such as ICI, J & J, 3M and Johnson Matthey have entered the field of dental consumables. In some cases with considerable success but in other cases, they must be losing a considerable amount of money in their Dental Divisions. However these large companies live on such a substantial scale that they can afford to lose money in the dental sections for several years before it worries them.

    Unfortunately there are no real worldwide statistics available, but if the figures quoted in the Monopolies Commission Report back in the 1950s are adopted the total United Kingdom dental market is probably not much more than £80 million today in 1987.

11. The development of materials in the Dental Field has been hampered by the ramifications of the Medicines Act. This was set up to approve mass-sale pharmaceutical products bought by members of the public. It is being used for minute sale products bought by dentists. The cost of getting a new product accepted under the Medicines Act is quite prohibitive when it refers to small dental quantities, and the length of time it takes is also incredibly long. Thus no British producer of dental pharmaceuticals really exists anymore because they find it too costly and difficult to get established in their home market. Most dental medicines now come from one very large French company, which has a sufficient world sale to justify the time and money expenditure in obtaining the necessary British licences. The resulting products are enormously expensive because of all this background.

    Few producers from outside the dental field can be encouraged to come in with the small turnover potential they see, especially when they are faced with all the regulatory controls covering production, standards, electricity, air, sterility, etc. Even in the field of Standards there is confusion, with different Standards existing in different countries for the same product. The intention is that all should move towards the ISO Standards, but it is taking time to get there. In the meantime, a manufacturer often has to receive and pay for visits from Inspectors from all sorts of overseas countries before their product is approved for sale in that country.

The points listed above highlight some of the problems faced by the Dental Industry in this country.

November 1987

Letter from the Royal College of General Practitioners

We appreciate your invitation to us for our views on priorities in medical research. We are a Department of Health and Social Security Unit working within the College of General Practitioners and concerned with the routine provision of data about communicable diseases[1] and with the prosecution of National

[1]Fleming, D M, Crombie, D L The Incidence of Common Infectious Diseases: The Weekly Returns Service of the Royal College of General Practitioners. Health Trends. Vol. 17 p13–16. 1985.

Morbidity Surveys.[2,3,4,5] Both these functions depend on the routine gathering of relevant data within a national network of practices. In addition to their primary purpose of providing information about disease incidence nationally, these data give us a useful insight into the problems and implications of variability between doctors and in so doing have much to say about quality of care in general practice. We have also been concerned with simple recording systems designed to measure general practitioner performance in various activities and with the exploitation of information gained thereby in the prosecution of audit by self-evaluation.[6]

Our own immediate priority is the expansion of the Weekly Returns Service (WRS). Available data about communicable diseases is very limited.[7] Nationally, this service is the only source of data concerned with infectious disease which can be related to a fixed population. For some illnesses, for example mumps, rubella and chicken-pox, it is the only source of data. The size of the practitioner sample is sufficient only to derive a satisfactory national picture and we feel there is a need for such data at least at regional level. Our second priority stems from this point in that arguments favouring a regional network for the WRS apply equally to the provision of a larger regional sample for the National Morbidity Survey (NMS).

Our third priority is the facilitation and encouragement of audit in general practice by self-evaluation. This is peripheral to our programme but we take the opportunity to encourage it wherever we can.

Finally, we are involved with doctors in the European countries in collaborative research in primary care.

Funding of this Unit is almost exclusively provided by the DHSS. From time to time and notably for our involvement in encouraging activity analysis for self-evaluation, we have been funded by our own Royal College. Our European activities are funded separately though many of these are funded out of "our own pocket".

In reply to your nine questions:

(a) We are not aware of any forum in which priorities are set and therefore cannot see them reflecting the health needs of the nation except by chance.

(b) This question demands a global appreciation of research resource allocation which is not available. Innovative clinical research is exciting and there is always a supportive lobby in the form of a group of sufferers. Research directed towards eliminating waste requires the collection and analysis of routine statistical data, and because it is inevitably threatening to the status quo, will never have a substantial supporting lobby. We would like to see innovations in the delivery of primary care most especially of emergency care and would expect them to be properly evaluated. The provision of emergency medical services is producing increasing problems both because of abuse on the part of patients and dissatisfaction among doctors. A radical rethink and the testing of alternative methods are both needed. This is the area in which any substantial risk of breakdown in the NHS may occur.

The long-term adverse effects of drugs are difficult and costly to research. Increased resources would certainly influence this area of research but otherwise we doubt if priorities would change very much.

(c) Broadly speaking yes, but this should not necessarily be seen as desirable. Progress in organ transplant surgery is a technological advance which has enormous implications for the nation, but the costs of meeting the fruits of the technological advances already available are so great that the political will needs to be expressed before excessive investment is put into research. In many ways, we recognise this to be a more difficult decision than saying yes or no to an application for research funding.

(d) Some research areas are more glamorous than others. This is reflected in the funds made available to various charities and in the allocation of their resources. Research in general practice is often comparatively unglamorous and in the nature of the job scientifically less elegant. General practice research is thus more difficult to fund unless the research has direct commercial interest (for example randomised clinical trials).

[2]Royal College of General Practitioners, Office of Population Censuses & Surveys, Department of Health and Social Security. Morbidity Statistics from General Practice. Second National Study 1970–71. Studies on Medical and Population Subjects No. 26. HMSO 1974.

[3]Royal College of General Practitioners, Office of Population Censuses & Surveys, Department of Health and Social Security. Morbidity Statistics from General Practice 1971–72. Second National Study. Studies on Medical and Population Subjects No. 36. HMSO 1979.

[4]Royal College of General Practitioners, Office of Population Censuses & Surveys, Department of Health and Social Security. Morbidity Statistics from General Practice 1970–71. Socio-economic analyses. Studies on Medical and Population Subjects No. 46. HMSO 1982.

[5]Royal College of General Practitioners, Office of Population Censuses & Surveys, Department of Health and Social Security. Morbidity Statistics from General Practice 1981–1982. Third National Study. Microfiche. A publication of the Government Statistical Service. HMSO 1986.

[6]Crombie, D L, Fleming, D M Report on Practice Activity Analysis. March, 1987. Obtainable from the Birmingham Research Unit.

[7]McCormack, A Editorial. French Lessons in Surveillance of Communicable Diseases. Brit. Med. Journal. 294. pp 74–75. 1987.

(e) The results of good research are adequately disseminated.

(f) We suspect rationing by funding bodies actually goes a long way to achieve this at least from our vantage point in general practice.

(g) Not always (see Question (c)). The results of research may propose a course of action which has cost consequences and the benefit can only be appreciated if these are met. For example, there is now sufficient evidence to say that careful checking of the BP at regular intervals during middle life would lead to the identification of hypertensives and appropriate treatment will enhance quality and quantity of life, but the cost implications have not been addressed. Contrarily the government has recently decided to increase facilities for routine mamography but the evidence for doing this is probably not as strong as that for checking blood pressure.

(h) It is not so much the training of medical researchers specifically, but of doctors generally. Some concept of total health care is lacking in some doctors who work and research in narrowly based specialties.

(i) In the absence of a working knowledge of the organising of funding of medical research we cannot propose changes.

D L Crombie
Director
D M Fleming
Deputy Director

April 1987

Memorandum by the Royal College of Midwives Trust

Introduction

The Royal College of Midwives (RCM) is the professional organisation and independent Trade Union representing midwives throughout the United Kingdom.

The College was founded in 1881 as the Midwives Institute and became known as the College of Midwives in 1941 and was granted the Royal Charter 1947.

The College has national and international links with other organisations and is a member of the International Confederation of Midwives.

The aim of the RCM is to advance the art and science of midwifery and one of its several objectives is to encourage research interest and promote research by midwives on all aspects of their work.

The RCM welcomes the opportunity to respond to the inquiry by Sub-Committee II. As the Sub-Committee intend their enquiries to cover all areas of research in the health service it is appropriate for the RCM to respond on behalf of the midwifery profession. The responses are made in reply to the nine specific questions set by Sub-Committee II—Medical Research, noting that it is with particular reference to the needs of the National Health Service.

Responses to Questions

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

There has been no systematic identification of themes in relation to midwifery research. Priorities have emerged as midwives and others have seen the need within the midwifery service from their own perspective.

At the RCM Annual Conference this year the Parliamentary Under Secretary for Health announced that money would be allocated to fund a core post for a midwife researcher. The money has been allocated to the National Perinatal Epidemiology Unit at Oxford with a tenure of five years.

The midwife appointed will be expected to develop a programme of midwifery research relevant to the evaluation of perinatal practice and organisation. Priority areas for research will be the effective use of resources and customer satisfaction within the maternity services.

Research initiated by the RCM together with the Central Midwives Board and with funding from the Department of Health enabled a major study to be undertaken of the role and responsibilities of the midwife. This study was published in 1984 by the Chelsea College Nursing Education Research Unit (now Kings College, University of London).

Research undertaken by the National Perinatal Epidemiology Research Unit has included a project on midwifery practices within the maternity service.

Nursing and midwifery has been almost totally dependent on DHSS funding for major research initiatives.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

It is difficult to know if the balance between the different branches of research is right, as each branch will of necessity have a greater understanding of its own needs and provisions for research.

Nursing and midwifery research is still in its infancy in comparison with medical research. There was little research into midwifery practice before the 1960's and then it occurred only spasmodically. It has increased steadily since the late 1970's. During the last 10 years much of this increase has been devoted to educating midwives in research methods. The number of midwives who have experience of and or qualification for research is less than 1 per cent of the whole profession.

The RCM has organised as one of the mandatory refresher courses for midwives a specialist course on research appreciation. This research appreciation course has been in operation since 1976. 55 midwives attend this course and each year the course is either fully booked or over subscribed.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

More research in midwifery is needed in order to provide information on:

— the quality of the care provided

— the best use of resources

— the needs of the consumer

— the professional roles and responsibilities of each member of the care team.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

Apart from the funding indentified in response to question (a) midwifery research is mainly dependent on very small amounts of money obtained from charitable funds. This means that priorities cannot be addressed.

Examples of charitable funding includes the RCM/Maws award of £1,000 per annum to a midwife wishing to undertake research in relation to practice, education or management of midwifery (see appendix II for examples of studies).

The Iolanthe Trust also provides funding for midwifery research. Amounts awarded vary, the maximum being about £5,000. Funding for a small number of studies has also been obtained out of local National Health Service budgets.

(e) *Are the results of research adequately disseminated?*

Considerable efforts are made within the nursing and midwifery professions to disseminate information on all aspects of relevant research findings.

The RCM publishes a quarterly Current Awareness Service. In September this year the cumulation of these references was published by the RCM as a Midwifery Index containing approximately 12,500 references relating to midwifery and associated subjects. This Midwifery Index is not only the first edition of its kind in the United Kingdom but also the first in the World.

The RCM has plans in process to develop a computerised database of midwifery information. Research also appears on the agendae of the RCM advisory group meetings. These groups are attended by Heads of Midwifery Services and Senior Midwife Teachers.

Research is included in basic and post basic education programmes for midwives. Conferences, study days, forums and interest groups are organised by the RCM and other groups throughout the country. In appendix I reference is given to the Research and the Midwife Conference Proceedings organised jointly between the University of London, University of Manchester and the Royal College of Midwives.

(f) *How is unnecessary duplication of research effort avoided?*

Midwifery research has not yet reached the stage of having unnecessary duplication as midwifery policies and practices are seriously under researched.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

There is some evidence of midwifery research being refleted in direct patient care, but it is less clear in health education.

Examples of research changing practice to the benefit of consumer and appropriate use of resources may be cited in respect of the following studies:

(a) Romney M. "Is your enema really necessary" BMJ 18.iv.81 pp 1269–1271

(b) Sleep J "Episiotomy" West Berkshire Perineal Management Trial

(c) Romney M "Predelivery shaving: an unjustified assault? J Obst. Gynae. Aug 1980 pp 33–35.

Common problems in the implementation of research focus around the needs for:

research to be relevant and funded;

skillfully written research reports available to the care givers;

care givers who are educated to implement research findings;

a supportive work environment providing opportunities for research findings to be applied in practice.

(h) *What changes in priorities in the training of medical researchers are needed?*

There is a need for more training opportunities for midwives who are contemplating research or actually involved as primary researchers.

There needs to be career development opportunities for nurses and midwives wishing to follow the research path. At present there are only two midwives involved in research at post doctoral level.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

Midwives would be in a better position to seek funding from charitable organisations if they had more opportunities for education in research.

Finally the Royal College of Midwives recommends that a Nursing and Midwifery Research Council be set up as a supervisory grant giving body. This would be a major step forward as there is no equivalent in nursing or midwifery to the Medical Research Council in offering support to research initiatives. Half a million nurses and midwives working within every hospital and community setting in the NHS could make a major contribution to care based on well founded research principles. This in turn would result in better equipped and informed care givers, more appropriate use of resources and greater consumer satisfaction.

September 1987

Memorandum by the Royal College of Nursing of the United Kingdom

The Royal College of Nursing welcomes the opportunity to comment on the questions from the Sub-Committee II—Medical Research. We recognise that the scope of the questions relates specifically to medical research but have assumed that this embraces research in nursing and the delivery of nursing care.

(a) It is difficult to know exactly how research priorities are set. Many seem to be borne from a sense of necessity (that is HIV research) and many others from a sense of political or economic expediency (for example multiple organ transplants). The RCN channels its limited research funds into projects which will enhance nursing and be of direct benefit to patients/clients.

(b) From a nursing point of view it is clear that the research priorities are not right. Nursing research at all levels is inadequately funded and this, in our opinion, is a woeful situation. Nursing is and will continue to be the single largest factor involved in the treatment of patients (wherever they are cared for). Many studies over many years have demonstrated the value to both patients and the service of good rigorous nursing research, for example:

Lelean S (1972) *Ready for report, nurse?* RCN London.

Hawthorne P (1974) *Nurse I want my mummy*. RCN London.

Hayward J (1973) *Information, a prescription against pain*. RCN London.

Towell D (1975) *Understanding psychiatric nursing*. RCN London.

Brooking J ed (1986) *Psychiatric nursing research*. Wiley London.

Luker K (1982) *Evaluating health visiting practice*. RCN London.

and many, many more.

It may be that subsuming nursing research under the umbrella of the medical profession would allow more resources to be allocated but this too is an undesirable option. Research into nursing is fundamental to the needs of the NHS, whether the research be clinically based or focused on management issues.

(c) Many instances of medical research are forward thinking and innovative. However many seem to be reactive and even more seem so esoteric and repetitive as to mean little to the profession. We still seem to be valuing those individuals in productive life and ignoring the major difficulties encountered by the increasing numbers of elderly frail. Many of the advances required by this group require nothing more than priority on waiting lists, sound research into their nursing needs and not necessarily new technologies. Groups such as these are an enormous drain on the public purse.

(d) It is difficult to consider the extent to which research priorities may be influenced by funding bodies without delving into the realms of conjecture. It is clear from much of the research carried out in nursing that there is little or no interference but that may be because there is so little funding and virtually none from the independent sector. It is difficult to imagine commercial interests supporting research without looking towards the outcome, although this does occur. Certainly much research into new medications carry large grant monies and there is a definite outcome which is both desired and expected. Public funding for research into nursing has been lacking, except for the small amount issued by the DHSS. Many of the locally organised research grants issued by regional health authorities go to medical research. This may be a measure of the preparedness of doctors to do research or the recognition that they are expected to do research as part of continuing progression.

(e) It is clear that medical research strives to be disseminated to the medical profession via the professional journals and occasionally through the media. What is patently clear is that the recipients of the results of much of the research do not get to hear of the changes in practice that they should expect to occur in the future. There is probably no easy answer to this type of problem, except to encourage nurses to become more involved and knowledgeable about research, and in their role as the patient's advocate, disseminate to those in our care.

(f) There is no central register of research (current) and this may lead to a duplication of effort. However, not all such duplication should be viewed as wasteful. Often interpretations of results will be different from different "experts" and this should continue. Certainly, lessons from the past should be learned in order to avoid tragedy (that is thalidomide). A central register of all research being undertaken (nursing, medical and management etc.) would allow far greater dissemination and perhaps help to avoid duplication. It would be useful if such a register were considered to be part of the research process and if access to the database was available to the professions via computer links. This would quite clearly need further debate.

(g) There is still much apprehension and doubt about the validity of research in the health professions and whilst this does not emanate from the researchers, it is clear that if the others are not "with us", then the cause can be lost. More needs to be done to increase awareness of research and its value to patients and to nursing. Whilst nurse trainees remain a part of the labour force of health authorities, attention to research is minimal. Nurses are still trained, rather than educated.

(h) It would be nice to think that a more holistic approach could be used in all research but this may be difficult to attain at a molecular level of research. Doctors often fail to consider the total needs of their patients and exclude the other members of the caring team who may have much to offer.

(i) Clearly the Royal College of Nursing would welcome an initiative in funding research and indeed sees this as one priority for the future. We recognise that we are dealing with finite resources but it must be sound economic sense to ensure that the practices that are being used are the most effective in terms of cost and care. We cannot run a quality service on a shoestring and ill-conceived notions of what constitutes good practice. Nursing research could allow us to achieve quality care at effective costs.

The Royal College of Nursing has taken a lead on this important subject. Currently, work is going on looking at specialisms in nursing and, in particular, at the care of diabetics and those people with stomas. Major work in the area of Standards of Care is also being pursued.

It is not surprising that nursing research feels somewhat bereft of funding. We do not believe that we can continue to rely on the goodwill of the public or on the charity of organisations for our funding. We must look to a strategy for research into nursing, one which will allow proactive evaluation of needs and

how to meet them. Nursing is the key to the future of health care delivery and it requires research to take the right path both for patients and the NHS.

As a consequence, a larger slice of the cake should be made available for nursing research.

May 1987

Memorandum by the Royal College of Obstetricians and Gynaecologists

BIRTHRIGHT—BACKGROUND INFORMATION

The Royal College of Obstetricians and Gynaecologists supports medical research through Birthright. Although Birthright is very closely associated with the Royal College of Obstetricians and Gynaecologists, (RCOG) it has a separate organisational structure. Birthright supports research related to the needs of mothers, children and the health of women and is prepared to support both basic and applied research within these areas of interest. Funds for Birthright supported research come from a number of specific legacies and scholarships and from a wide range of charitable fund-raising activities.

At present, Birthright supports research through four Birthright Units and a number of annually awarded project grants. The four Birthright Units are situated at King's College Hospital, London, St Mary's Hospital, London, Oxford and Sheffield. The Units are supported on a five year basis for specifically defined research programmes and receive support ranging from £50,000–£100,000 per annum. About 12–14 project grants are awarded annually on the basis of open competition for periods ranging from 1 to 3 years but none of the grants exceed £40,000. In 1987, Birthright allocated £300,000 to support of project grants.

GENERAL OBSERVATIONS

Two general observations can be made in relation to the research activities in the area supported by Birthright.

1. The number of applications received by Birthright greatly exceeds the number that can be supported. In 1987, a total of 93 applications were received but it was possible only to support 12 of them. Many of the applications which were not supported were regarded as of high quality and would have been highly recommended for funding if sufficient resources had been available. The great excess of applications over available resources reflects the great difficulty in receiving support at the present time from the main National Funding Bodies such as the Medical Research Council.

2. The majority of the applications came from clinical departments of Obstetrics and Gynaecology. Many departments find great difficulty in attracting funds for applied clinical research from the Medical Research Council. One reason for this is that applied clinical research, by its very nature, faces constraints which do not apply to animal research or basic research. As a result, clinical research fares badly in comparison with basic science when there is intense competition for funds. There is a case for evolving a system which can evaluate clinical research separately from basic research by those who can understand both the difficulties and importance of applied work.

RESPONSE TO SPECIFIC QUESTIONS

(a) *How are priorities for medical research set?*

Applications for research are considered by a Birthright Scientific Advisory Committee. The committee give weight to the potential practical value of any proposal before reaching their decision. At the same time the scientific quality of the proposal must also be taken into account. Birthright will give priority to applications which clearly relate to maternal or child health or the health of women and will rate highly any proposal with potential for practical application.

(b) *Is the present balance between different branches of research right?*

As stated in the general observations above, there are insufficient resources for clinical research. Many aspects of maternity care have been introduced into clinical practice without adequate evaluation and one contributory factor is lack of resources for clinical research.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

In general medical research follows quickly in response to changing patterns of desease. It is, however, necessary to maintain the appropriate level of audit so that changes in disease patterns are recognised quickly. To this end, it is essential that audit of both maternal and perinatal mortality and morbidity are both maintained and developed.

New technology has brought many innovations to obstetrics and gynaecology such as those brought about by ultrasound, immunology, monitoring in labour, laser treatment and so on.

Research is required both to devolop and evaluate these new technologies. There are dangers that technological development outpaces clinical evaluation and it is important that there are sufficient resources both in manpower and facilities to permit adequate evaluation.

(d) *How are the priorities in medical research influenced by the institutions through which research is funded?*

The institutions have considerable influence on the setting of the priorities and these, in turn, must reflect the views of the senior members of the institutions.

(e) *Are the results of research adequately disseminated?*

The results of research are disseminated through the standard scientific journals. The Royal College of Obstetricians and Gynaecologists also runs a programme of scientific meetings which gives opportunities for the presentation of recent research. In general, there are adequate channels for the dissemination of research results.

(f) *How is unnecessary duplication of research effort avoided?*

The main defence against this is by ensuring that grants for research are awarded only after scrutiny by experts who are aware of the work being done in the field.

(g) *Is research reflected as it should be in actual improvements in patient care or health education?*

In general, research does lead to improvements in patient care. There are, however, two constraints. The first is that there is often a deficiency in resources to implement the fruits of research. This is well illustrated in our own field where advances in the treatment of infertility cannot be applied because of lack of resources. The second is that the development of new knowledge is so rapid that it is difficult for all practitioners to keep up to date. A sound programme of post-graduate education is essential to meet this need.

The implementation of research developments is often dependent upon the work of specially trained experts. The RCOG is introducing programmes for the training of sub-specialists in obstetrics and gynaecology. These sub-specialists will have a vital role to play in the introduction of new techniques brought about by research, to improve patient care. It is important that there are sufficient resources to support the programmes of sub-specialist training.

(h) *What changes in priorities in the training of medical researchers are needed?*

As research and technology develop, increasing specialisation is needed for researchers. As mentioned above, this essential development of specialisation for researchers is being developed in Obstetrics and Gynaecology by the recognition of sub-specialists working exclusively, or almost exclusively, in specific areas. One measure which is required to assist this essential development is the establishment of specialist training fellowships. The RCOG is establishing two such posts, one for a member of the Royal College in the United Kingdom and one for a member from abroad. The establishment and support of such training fellowships should be given priority to assist effective research development.

(i) *Should any specific changes in organisation or funding be made?*

1. In the field of research activity supported by the Royal College of Obstetricians and Gynaecologists through Birthright, there are insufficient resources to fund much potentially valuable, high quality research.

2. Clinical research fares badly in competition with basic research and requires a new organisational structure to consider its needs more appropriately.

3. There is a need for greater research evaluation of new clinical practices which have been and are being introduced.

4. The development of sub-specialist training programmes and training fellowships will increasingly play an important role in research development. Funding is required to achieve the necessary development.

Memorandum by the Royal College of Pathologists

The Royal College of Pathologists Involvement in Medical Research

The College Members and Fellows consist not only of medically qualified persons, but also those qualified in veterinary medicine as well as non-medically qualified scientists.

Although research is not conducted on the College's premises, a significant proportion of its Members and Fellows are engaged in research. Thus, approximately 25 per cent of the Members hold academic appointments in university departments or other research establishments, and many with NHS appointments are also involved in some research and teaching.

The interests and requirements of trainees vary, but the College encourages them to conduct research, in the hope that many will pursue this activity to a varying extent during their professional life, since pathology provides the basis of clinical medicine.

In addition to encouraging training and development of such major disciplines as histopathology, chemical pathology, haematology, microbiology (including virology) and immunology, the College has taken the initiative in encouraging the development of such emerging disciplines as toxicology, cytogenetics and molecular biology.

A number of medically and non-medically qualified scientists gain admission to College membership and fellowship on the basis of their published works. Membership via this route is keenly sought, the candidates' research being carefully and critically evaluated by peer review.

The College's responses to the nine questions (a to i) posed by the House of Lords Sub-committee, are provided below:–

(a) Priorities in medical research are predominantly set by grant-providing organisations. Thus, priorities in research must reflect those of these organisations. The Medical Research Council (MRC) and such large industrially funded charities as the Wellcome Trust, fund both basic and applied research, supporting projects on the basis of their perceived merits as judged by peer review. This approach does not and should not directly reflect the needs of the NHS. The research councils should fund research which aims to answer those questions which are "ripe" of answering. The UGC follows a somewhat similar pathway, in that its priority is also directed towards excellence. In contrast, charitable organisations formed to meet the specific aims of one or a group of diseases (for example British Diabetic Association, National Heart Foundation, MS Society), quite properly pursue a somewhat goal-oriented approach. However, the larger charities also recognise the need to support some basic research. Research reflecting the needs of the NHS directly should receive support from the DHSS.

Although the pharmaceutical industry provides considerable support for research, both within and outside its own research establishments, their priorities are largely self-centred.

(b) In considering the balance in medical research, its division into operational research which relates to delivery of health care, clinical research of immediate benefit to patients, and basic medical research which may not be of obvious immediate benefit to patients, should be considered. Balance between research in different fields of medicine, for example, diseases of the lung or central nervous system should also be considered. At a time when the total amount of government funding for research has been considerably reduced, it is very difficult to identify over-funded areas. Operational research requires additional support, but this should come from the NHS itself, which unfortunately spends only a small portion of the resources on this type of investigation. Clinical research of benefit to the patient is generally well supported, as the immediacy of benefit attracts support readily from a variety of public and private organisations.

Basic medical research is relatively poorly supported, particularly at a time when rapid advances in medicine are likely to depend on the development and application of molecular biological techniques to a variety of medical problems. It must be stressed that the quality of future clinical research of benefit to the patient, is dependent on an increased support for basic medical research. In this time of funding famine, the support and maintenance of high quality basic research should have the highest priority. However, history has shown that the lines of basic research which are destined to lead to major advances of practical importance have not been recognised as such in advance. Thus priority for funding basic research must therefore be given to those with the talent and motivation to conduct original and innovative research. However, supporting basic research is essentially a high-risk activity, for it necessitates accepting that a substantial proportion of the research will be unsuccessful, at least in the short term. Consequently, excessive short-term audit of such research is likely to be counter-productive and inconsistent with scientific progress. The recent tendency to support research on a short-term basis will increasingly force research workers into more goal-oriented, more applied and safer avenues - to the long-term detriment of the progress of medical science.

The importance of basic research can be illustrated by the remarkable progress in the field of AIDS-releated research. Had it not been for the support given to basic research in molecular biology during the last 10-15 years, it would not have been possible to identify the viruses which cause AIDS or develop tests for screening and diagnosis. Any prospect for the development of vaccines is also heavily dependent on techniques developed by workers conducting basic research.

However, certain types of biomedical work require scarce and costly resources. A central provision of certain facilities has already occurred and is likely to develop further. Consultation between those who provide such resources should be encouraged to ensure their availability (for example MRC "brain bank" in Cambridge; topical magnetic resonance scanning). Funding for temporary attachment of would-be workers should be made available.

In the event of increased resources becoming available, it seems unlikely that research priorities would change.

(c) Priorities in medical research are responsive to pressures from disease-associated pressure groups. AIDS provides an obvious example, but the same is true of mental illness, heart disease and rheumatic disease. It has long been true for cancer.

There is an increasing number of elderly people in the United Kingdom, which has resulted in pressure to increase research into diseases of the elderly. However, this may be somewhat premature, for although work relating to the phenomena associated with ageing is being carried out, it has been of rather indifferent quality. This may reflect the fact that the basic biology of ageing is still poorly understood. Nevertheless, additional research into some diseases which affect the elderly, for example, bone disease, deserves additional support.

During the last 10-15 years, the impact of new technology, particularly molecular biology, on medical research has been striking; it is likely to continue to be so. However, new technology is not only expensive, but also requires personnel trained in techniques to which many older scientists are unaccustomed. This had led to worldwide competition for trained molecular biologists. The fact that many academic posts disappear or become frozen when their incumbants move or retire, together with poor salaries and uncertainty of research support, has resulted in many well trained and promising scientists accepting research posts in the USA and Europe. Consequently there is a dearth of young scientists available to introduce new technologies into many aspects of medical research in the United Kingdom.

(e) The results of research are adequately disseminated mostly by publications as well as by attendance at national and international meetings. Computerisation of medical literature will enable research workers to have better access to published research work. However, patentability fears have occasionally had an adverse effect on the dissemination of new biotechnological development.

(f) Although it is undesirable that large and expensive projects are duplicated where there is no clear benefit for so doing, it is essential that any observation of fundamental importance is replicated in laboratories other than where it was first described. Unnecessary duplication can be avoided relatively easily if only a single funding organisation is involved, but this is obviously more difficult to prevent on an international basis. In the United Kingdom duplication is unlikely to be a major problem since there is considerable cross-representation of scientific assessors on major research committees. As research within the EEC becomes more integrated, increased cross-representation on research evaluation boards within the EEC may become more common.

(g) There may be an excessively long time interval between making a scientific advance and its application to patient care and health education. The development of drugs for rare diseases provides a particular problem, in that they are essentially unprofitable as their projected use would not cover development costs. Technological innovators provide new methods for vaccine manufacture, but there is considerable and understandable reluctance by the pharmaceutical industry to become involved in their production. This is in part due to fear of litigation through vaccine damage. Thus, campaigns mounted by the press and other news media on whooping cough vaccine have not only a deleterious effect on uptake rates of this vaccine, but also on other vaccines. Although the evidence suggesting that there is an enhanced risk of brain damage following whooping cough vaccine is slight, the introduction of some form of no fault compensation for vaccines believed to have caused brain damage, would have an impact on improving the application of medical research by government.

(h) The able and highly motivated need to be attracted into medical research. Education of the next generation of research workers should be as diverse as possible since it is not feasible to anticipate research requirements in 10-20 years' time, as well as being aware of emerging disease patterns at that time. Medical training, at both undergraduate and postgraduate level, has become far too rigid; too many fixed hurdles have to be surmounted. For undergraduates, it is important that the course promotes initiative and teaches students how to approach problems, rather than concentrating on techniques and factual learning. The provision of the intercalated BSc year with its major research component in the over-crowded medical undergraduate course, is of major importance. Many undergraduate medical students have been stimulated by experience during this course and have subsequently entered careers in academic medicine. Opportunities for intercalated BSc courses should not only continue, but should be expanded. Unfortunately, and inappropriately, they have been reduced.

For postgraduate research workers, there is a need for more permissive training regulations which will enable the relatively small number who are seeking a career in research to follow an eccentric training programme. However, it must also be appreciated that there is a need to link advances in the basic sciences of biochemistry, immunology and molecular biology with clinical medicine. In this context, MSc courses, funded to a level to permit attendance by medical and non-medical graduates, could be improved.

(i) The main need is for a more adequate level of funding and one that is guaranteed over a longer period of time. The latter may be just as important as the former. It is much easier to come to terms with

some reduction in research funding providing that one knows that the level will be maintained over the period of the research programme, than it is with a continuous erosion of research support, where the cut level of one year is used for the basis on which further cuts are made in the next. It is furthermore quite unrealistic to use the Retail Price Index (which is based very substantially on such things as the cost of food and the mortgage rate) to estimate the degree of inflation in medical research costs. The quite unrealistic reimbursement for inflation in recent years has led to cuts in real research funding that are far greater than publicly admitted. Also, as, unfortunately, much research equipment has to be bought abroad, the level of the pound also causes wide swings in the purchasing power of a given grant. Genuine stability in research funding must be a matter of the greatest importance if the country is to get a decent return on its research investment.

Any increase in funding levels must also be directed towards improving the living standards of PhD students and early postdoctoral workers. Their life is one of poverty and this deters many from considering a career in biomedical research. More generous funding would enable them to receive as much as young clerks or secretaries working in industry in the City.

Security of employment tenure is too complex to be considered in detail. However, means are required to encourage the ready movement of young scientists between institutions and from industry.

Letter from the Royal College of Physicians

You sent a circular to Mr Lloyd, our Secretary, asking for our views on priorities in medical research.

There are one or two general points we would like to make:

(1) Research is only useful if its results are published and steps are taken to implement the recommendations that proceed from it. Much of the benefit of recent research is not being translated into action. We think particularly of the need for stronger steps to reduce smoking and alcohol abuse, and to implement a proper programme of immunisation throughout the country.

(2) It is important to encourage and facilitate "non-directed" fundamental research. All applied research depends on knowledge that has accrued from basic research, usually carried out without any objective in view. If we do not continue to support such basic research, our opportunities for carrying out applied or directed research will dwindle. To illustrate my point, may I draw attention to the outstanding achievements that have been made in our understanding of the nature and mechanism of action of the infecting agent for AIDS. The basic work on the enzyme reverse transcriptase appeared to have no direct application when it was carried out 15 or 20 years ago but, without this knowledge, we would have no understanding at all about the present epidemic. Conversely, when President Nixon attempted to direct a programme of research to find a cure for cancer, it failed because the basic scientific understanding was lacking. A point which emerges from this is that directed research can only succeed when a sufficiently strong scientific base exists. We make this point to stress (a) the importance of basic research and (b) the futility of directing research that is not likely to succeed because the basic knowledge is lacking.

We should like to comment on some of the nine specific questions you ask:

We would divide priorities in medical research into those which are operational, for example which concern the running of the Health Service, and those which are of primarily medical or scientific interest. The latter often develop from knowledge about the former. In other words, one can pick out the major health problems of the nation and attempt to direct research towards their solution; this would always be subject to the above-mentioned general points. We have reservations about the planned study of priorities for medical research. The most successful research is often opportunistic, depending on the availability of good scientists working in a particular field at a particular time. An important priority in research is to pick good investigators and to back them strongly.

In the light of this, we would regard it as unreasonable to adopt a general philosophy about priorities in research. We would prefer to see support given to strong programmes with outstanding scientists and, conversely, support removed from weak programmes with poor scientific underpinning.

An important question in your circular is (d). As general funds to support research have diminished, so the importance of funds from charitable sources has increased. This has caused an imbalance in the conduct of medical research in this country. Certain charities have tremendous public appeal, for instance those concerned with cancer, arthritis and rheumatism, heart disease; others, for example those concerned with chronic and crippling diseases such as stroke, have far less appeal. As a result, certain charities have been able to attract large sums of money with which they have endowed Chairs and academic departments to teach and carry out research in their specific fields. The general reduction of UGC support to medical schools has led to the current diminution in support for the less popular topics. In particular, it has become increasingly difficult to fund research in general non-applied fields, such as molecular biology or

immunology, which have been so fertile in providing major advances of direct clinical application. In addition, we are now increasingly dependent on funding from the pharmaceutical industry. While we recognise the importance of much of this work, we are concerned that an inordinate amount of academic effort is being channelled into routine testing of new drug formulation and many academic departments, especially those in clinical pharmacology, are obliged to devote personnel and resources to this relatively unrewarding and unedifying work.

Under (e) you ask if the results of research are adequately disseminated. We believe the answer is "yes".

Under (f): duplication of research is discouraged by funding organisations which would not support work that was lacking in novelty. We believe that some duplication of effort is necessary as much of the effort put into research is motivated by the spirit of competitiveness: In addition, it is accepted that verification of reported work is not only desirable in its own right, but that attempts to verify often bring out important disagreements and a better understanding.

Under (g) you ask about the reflection of research in improvements in patient care. Worthwhile research does ultimately produce benefits to patients but the time lag can be extremely long. There are many examples of this delay, for instance:

Our understanding of the structure of DNA commenced with the report of Crick and Watson in 1953; only in the last few years has this immensely important scientific knowledge been translated into practical application, for instance, through our new ability to detect and prevent genetic disorders at an early stage of pregnancy, our new understandings of cancer, immune responses and so on. A classic paper by Comroe and Dripps some years ago analysed the major innovations in cardio-respiratory disease and showed how these were dependent on research that had been carried out 20, 30 or 40 years earlier and that appeared to have no direct bearing on their ultimate application.

Under (h), you ask about training of medical researchers. It is imperative that we attract high quality, bright, imaginative research workers who should be trained in the best laboratories we have, encouraged to go abroad if needed and, above all, who need to be offered secure careers so that they do not feel the need to emigrate or to take up posts in industry that might not exploit their talents to the full. The training programmes of the Medical Research Council and the Wellcome Trust are exemplary.

Finally, under (i) you ask about specific changes. We would stress the importance of maintaining a high level of research in this country. In terms of "value for money", our standing in the international community must be very high indeed. Despite this, there is a profound sense of demoralisation and despair within academic medical circles at present and the best of our graduates are no longer being attracted into academic careers. The reasons for this are multiple, but they include a sense that the Government is not supportive of research of academic institutions in general. An overt expression of support would do much for morale and would also ensure our future international standing.

Raymond Hoffenberg

April 1987

Additional letter from the President of the Royal College of Physicians of Edinburgh

When talking to Professor Walter Holland last week I informed him—in passing—that I have been elected Chairman of the Joint Committee on Higher Medical Training in succession to Sir Douglas Black.

The relevance of this to the Select Committee on Science and Technology is that agreement has been reached in principle for the establishment within the structure of the JCHMT of an ad hoc advisory committee. This will permit a far greater degree of flexibility in the provision of advice to young men in training because we propose that this committee will consider, on an ad hominem basis, the position of trainees who have followed an unusual pattern of training in a field for which there is no approved training programme. This ad hoc committee will be chaired by me and is in the process of formation.

M F Oliver CBE, MD
President

December 1987

Letter from The Royal College of Psychiatrists

Your letter of the 3 March 1987 has been considered by the Research Committee of the Royal College of Psychiatrists. This is a Standing Committee of the Royal College and considers all research matters relating to the Royal College. It gives advice to the College and to College members on research and under its auspices a large number of research projects have been carried out. The Committee has also been responsible for the setting up of the College's newly established Research Unit. The Committee has small amounts of money available to carry out research but the major projects have been funded from external sources (for example DHSS Grants). The Committee consists of many eminent psychiatric researchers who carry out their own research programmes independently of the Committee. There are representatives from the DHSS and from the Medical Research Council on the Research Committee.

In response to the specific questions asked the Committee wishes to make the following points

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

Research priorities are set partly by funding bodies such as the MRC and Medical Charities and partly by initiatives from researchers. This is done by balancing the frequency and importance of medical problems with the scientific opportunities for solving them. The latter depend on scientific techniques and on the availability of good investigation. Psychiatric disorders are frequent, often long lasting, and important in their effects on the patient and his family. Until recently, opportunities for scientific advance were limited, but much progress has been made and this now requires greater funding of psychiatric research. Psychiatric research is much less well funded from charitable and commercial trusts than many other areas of medicine.

(b) *Is the present balance between different branches of research right?*

Medical research has been cut back so severely that there are no areas in which effort could be reduced to provide for new work without retarding progress in existing projects.

(c) *Are priorities in medical research adapting to changing incidence of desease, changing population structures and new technology?*

In general this does happen but shortage of funds makes it harder to bring about change, since much medical research is long term and without "new" money adjustments have to await the completion of current work and/or the retirement of staff. The increasing awareness of the prevalence of psychological problems and psychiatric disorders in general practice and general hospital populations has not been matched by increased funding of psychiatric research.

(d) *How are priorities in medical research influenced by the institutions through which research is funded?*

In general there is good collaboration between the MRC and Medical Charities. Research priorities set by the DHSS tend to be more influenced by matters currently in the public eye.

(e) *Are the results of research adequately disseminated?*

Yes, in a wide variety of medical meetings and publications. There is a tendency for negative findings to reach publication less often and understandably to attract less attention though of course from both a scientific and a clinical point of view such results are just as important.

(f) *How is unnecessary duplication of research effort avoided?*

Firstly by the collaboration between grant-giving bodies referred to under (d) and secondly by the system of peer review of projects adopted by all grantors. National and international meetings of researchers ensure that research findings are presented before publication and researchers new to the field can determine what work has already been completed or is in progress.

(g) *Is research reflected as it should be in actual improvements in patient care of health education? If not, why not?*

Yes; advances in research are generally taken up quickly. When new methods are not adopted this is usually because NHS funds are lacking, not because doctors are unwilling to alter their practice.

(h) *What changes in priorities in the training of medical researchers are needed?*

In psychiatry and relevant basic research in neuroscience, the need is for interdisciplinary training for scientists. For clinical scientists it is for a more flexible approach of bodies regulation professional training, to make it easier to pursue research and at the same time acquire clinical experience and qualifications.

The Fellowship Schemes of the MRC, the Mental Health Trust and Wellcome are invaluable and should be maintained or extended.

(i) *Should any specific changes in organisation or funding be made in order to increase the quantity or application of research?*

The overriding priority is for a restoration of adequate funding for medical research.

C P Freeman
Secretary
Research Committee

April 1987

Letter from the Royal National Institute for the Blind

Thank you for your letter dated 3 March 1987 addressed to Mrs Anne Hare Brown. This has been passed on to me in my capacity as Prevention of Blindness Co-ordinator as it is that section of the RNIB which deals with any medical research rather than the Health Officer and her Department and Committee.

RNIB has supported research into the amelioration and prevention of blindness for many years. One purpose of this was to further the careers of suitably qualified young men and women in the fields of ophthalmology or basic scientific disciplines relevant to research into the aetiology of eye disease. However, as the limits of statutory funding have been eroded over the years, the RNIB, and other similar organisations, have found it necessary to increase activity in this area both to encourage the training of workers in the field, and promote interest into areas of research which might otherwise be neglected.

The RNIB offers three types of grant: fixed sum awards for equipment and consumables; studentships; and fellowships, the latter are both based on MRC rates.

I enclose copies of three quinquennial reports which give details of all the research RNIB has supported in recent years, from these you will see the scope and nature of the work sponsored. Also enclosed is a copy of our annual report which gives a general idea of the level of funding available for this service.

If you require any further information, please do not hesitate to get in touch.

Miss Rita Oliver
Prevention of Blindness Co-ordinator

April 1987

Letter from the Royal Society of Health

The problems of British research and research workers are being well ventilated at the present time and it is acknowledged that lack of money is only one part, although a potentially lethal part, of the problem. Attempts have been made recently to rectify some of the more severe financial restrictions and there is considerable discussion of the whole area. Much of the discussion is devoted to areas of high technology such as communications technology and computer science which are obviously of vital importance for British trade and development. This, however, may tend to leave health sciences at risk of neglect, consequently we welcome the initiative of the Science and Technology Committee.

The Royal Society of Health which serves to integrate many areas of health interest and to foster collaboration between those interests wishes to draw the attention of the Sub-Committee to the smaller areas of research which are often neglected in competition with the big projects.

While the Sub-Committee has the remit to consider priorities with particular reference to the needs of the National Health Service it does include research in other sciences with a bearing on medical research.

Such activities are often carried out by small groups in technical colleges, polytechnics and Universities and even part-time by individual health professionals otherwise engaged in routine work. They often make a valuable contribution to research and development, provide new stimuli and fill gaps left by larger heavyweight research teams. We would suggest that there is a need to set aside specific funds to assist such small groups which might not otherwise qualify even to apply to the Research Councils. Indeed some fall between the stools of different grant-giving bodies; generally, however, they are too small for consideration and would not have any degree of priority.

Access to such funding has at times led to developments into major projects of some significance. With shrinking finance and the need to concentrate support in priority areas such small projects are continually disappearing yet the sums involved are an extremely small part of those needed for major projects.

A E Bender
Chairman of Council

April 1987

Memorandum by the Royal Society of Tropical Medicine and Hygiene

1. The Royal Society of Tropical Medicine and Hygiene is the one body in the United Kingdom representing all aspects of Tropical Medicine and Tropical Public Health together with the basic sciences, especially parasitology, which relate to this area.

2. Although the Society as such neither funds nor carries out research, it represents and contains amongst its Fellowship the great majority of those in or from the United Kingdom who are involved in carrying out, advising on, or utilizing the direct results of tropical medical research. The Fellows have been consulted and several key issues have emerged repeatedly from the submissions received.

3. The evidence submitted by the Society bears on questions (a), (b), (c), (g), (h) and (i) although it can only be structured around those questions separately with much repetition.

4. The Society's concern with research is naturally in a global perspective, but the submission emphasizes the relevance of research in tropical medicine to the health of the Nation and of British nationals while overseas, and particularly to the National Health Service.

5. Research in tropical medicine, tropical health, and related fields contributes to national needs, even if narrowly defined, in the following categories:

(i) Research related to the diagnosis, prevention and treatment of disease in travellers from the United Kingdom not only leads to greater safety for the 20 million visits abroad made by United Kingdom citizens each year but also reduces the burden of imported disease on the NHS and assists the management and prevention of disease in immigrant and ethnic minority communities, who in total form a significant part of the population of the United Kingdom.

(ii) Research carried out in the tropics can be of great value in understanding disease problems encountered within the United Kingdom. The tropics may provide far greater numbers of cases, so allowing the evaluation of new treatments, as in the case of cerebral malaria; there may be opportunities for study of epidemic disease at a more massive and advanced stage than in the United Kingdom, so allowing lessons learned to be applied to devising preventive measures here—AIDS is a clear example; and the multiplicity of developing country environments, cultures and life styles may allow testing of hypotheses about the causes of high blood pressure, heart disease and cancer far more effectively than is possible within the United Kingdom alone.

(iii) Research on tropical problems leads to advances in basic scientific understanding which are then applied to many other aspects of British medical research. The contributions of trypanosomiasis research to basic molecular biology and of schistosomiasis to the understanding of eosinophil function are examples. A recent MRC report on Parasitology addresses some of the issues. At a different level, problems of tropical community health care delivery have led to concepts and theory subsequently used in coping with developed country problems.

6. In this context there are many areas of neglect, in terms of specific disease problems, of population groups, and of health care delivery. Underlying these are exceedingly severe long-term research career issues.

7. In relation to question (c), there are four populations which are liable to be overlooked in the conventional medical structure and in the research applied to them. First is the *immigrant* population. Some research, particularly into nutritional disorders and tuberculosis, has been carried out on immigrants but wider surveys, for example, in relation to chronic parasitic infections which may damage their health in subtle ways, have not been looked into. The second population comprises British *travellers* comprising businessmen as well as tourists who are at risk from a wide range of diseases overseas. Where the travellers are employed by a large multinational, with its own health organisation, consideration is usually given to these risks. Travellers working for small organisations, or proceeding independently, normally pay no attention to the risks involved, commonly become ill, the diseases pose diagnostic problems to the health service and result in considerable prolonged morbidity and occasional mortality. British *servicemen* spend substantial amounts of time exposed to high risks of such diseases as malaria and leishmaniasis, and tropical medical research makes a significant contribution to the defence of the realm, as does the body

of tropical experience built up. Lastly, there is a diminishing but significant population of ex-colonial residents and former Japanese prisoners of war who continue even now to suffer from chronic tropical diseases acquired overseas.

8. There is a need for United Kingdom involvement in the epidemiology, diagnosis, prevention, treatment and pathogenesis of AIDS particularly in Africa with special attention being given to those aspects where we have unusual expertise in such areas as parasitic opportunistic infections, vector transmission, tropical epidemiology and the pharmacology of infectious diseases.

The AIDS pandemic calls for urgent action in research relating to the following areas: the factors predisposing to heterosexual spread of the virus in Africa; the cofactors for HIV infection and development of AIDS in tropical and temperate areas; the development and testing of potential HIV vaccines and drugs to treat patients with HIV infection and the pattern of opportunistic infections in Africa and the detection, natural history, infectivity and management of these infections in the context of immunodeficiency.

The African epidemic directly affects the NHS in terms of United Kingdom travellers, overseas immigrants and visitors to the United Kingdom, in addition to providing important insights into aspects of HIV infection which do not yet affect the United Kingdom.

9. Diseases of high prevalence in the tropics and where research is needed to assist in coping with imported diseases and infections within the United Kingdom include the major tropical killing diseases, diarrhoeal disease, malnutrition and respiratory infections together with the six major tropical infections given priority by the World Health Organization: malaria, filariasis, leprosy, schistosomiasis, trypanosomiasis and leishmaniasis. In addition such diseases as tuberculosis, hydatid disease and hepatitis are more prevalent in the tropics.

10. Two areas of notorious neglect relevant to questions (c) and (g) are clinical parasitology, and tropical clinical work and histopathology. Clinical parasitology is usually omitted in terms of research as it affects patient care and health education. Diagnostic standards in parasitology, which are normally carried out in microbiology or haematology laboratories throughout the country, are uniformly poor. Common and important parasitic infections such as malaria and hookworm are not correctly diagnosed. Parasitic infections are becoming increasingly important in travellers and immigrants. 2,309 people became ill in the United Kingdom from malaria caught overseas in 1986, for example, as compared with 74 in 1966. They are also important in immuno-suppressed individuals such as those being treated for leukaemia or by transplant surgery and especially those suffering from AIDS virus infection. Parasitic diseases are killing at least 50 per cent of those who die from AIDS (pneumocystis and cryptosporidium). Moreover, imported malaria continues to be a problem. There are increasing numbers of expatriates based in the tropics. There is only one Consultant Parasitologist in the NHS and he has only limited R&D resources. Funds for practical applied research on malaria prophylaxis are inadequate and on vaccination policies are neglected.

There is insufficient clinical research aimed at improving the practical clinical management of patients suffering from tropical diseases. Knowledge of underlying pathophysiological processes is usually necessary before treatment can be improved. Recently, there has been emphasis on primary health care and, at the other extreme, on application of the techniques of molecular biology to certain tropical infections. High priority needs to be accorded to programmes aimed at improving the use of existing and emerging drugs in tropical infections. Facilities for clinical research are inadequate and the continued pressure on and uncertainty over the location of the Hospital for Tropical Diseases worsen the situation. In tropical histopathology no funds are made available for the single post in the United Kingdom that is crucially needed.

11. The most serious limiting factor to United Kingdom tropical medical research is the lack of an adequate career structure. There is an obvious need for long-term earmarked funds to ensure the recruitment of research workers to ensure continuity of effort in a neglected area of research which is becoming of increasing relevance to the NHS as more and more people are exposed to diseases which are no longer confined to the tropics.

12. Research workers, especially in clinical infectious disease and in epidemiology need to spend time overseas, where the diseases are highly prevalent, in order to gain expertise rapidly, which can benefit their research and practice in the United Kingdom greatly.

Memorandum by the Science and Engineering Research Council (SERC)

1. The Science and Engineering Council is one of five research councils whose role was defined in 1972 (Cmnd 5046) as being "to develop the sciences as such, to maintain a fundamental capacity for research, and to support higher education". Their roles are complementary and medical research is, of course, the business of the Medical Research Council. SERC's interests are peripheral and arise where its responsibilities for science and engineering impinge on medicine. The support of basic biological science is within its

ambit, and an appreciable part of the work supported by the Council in fields such as biophysics, biochemistry, microbiology, genetics and cognitive science, and also in organic chemistry, contributes to the broad base of basic and strategic research which will lay the foundation for practical applications in the field of medicine. Within these subject areas are some topics selected by the Council as "special initiatives". These include protein engineering and molecular recognition; the case for a new initiative is selective drug delivery and targeting is now being developed. SERC is also responsible for the support of pharmacy through the provision of research grants (about half a million has been committed over the past four years), and through the provision of training awards. 23 research studentships are at present reserved each year for the support of research in schools of pharmacy.

2. SERC's interests also impinge on medical research through the activities of the Biotechnology Directorate, whose main aims are to foster and coordinate academic research in this field, to encourage the formation of an active community, bringing together the contributing science and engineering disciplines, to encourage industrial involvement and promote the industrial application of SERC-supported research. A distinctive feature of the Directorate's activities is the development of "clubs" of industrial collaborators setting up and with SERC funding a number of inter-related academic research programmes, with the intention of facilitating the translation of strategic research into products and processes. The current annual financial provision for the overall activities of the Directorate is four point three million pounds. About one third of this is directed to the support of postgraduate training in the field of biotechnology, to which the Directorate gives special attention. The Directorate also supports work on the development of new drugs for the pharmaceutical industry.

3. The invitation to submit evidence makes explicit reference to research and development in the pharmaceutical and medical equipment industries. Industrial collaboration in the Council's support of research and development is effected through two major procedures. SERC encourages the support of research in academic institutions through the award of collaborative research grants, which involve programmes carried out by an academic and an industrial partner. SERC supports, by means of a research grant, all or part of the work in the academic institution while the industrial partner matches this by doing part of the work itself or making a financial contribution available to the academic partner or both. 25 such awards totalling about £850 thousand have been awarded in recent years for programmes carried out in association with pharmaceutical companies. This form of support is complemented in the field of training by the Council's scheme for cooperative research studentships which involve the joint supervision of the student by a member of the staff of the academic institution and an employee of a United Kindom industrial firm or public service organisation. About 500 such awards involving pharmaceutical companies are now current.

4. Special attention has been paid by the Council to the interests of the medical equipment industry through the medium of a "specially promoted programme" in medical engineering. Such programmes are designed to bring the academic world and industry closer together in research in engineering and applied problems of national importance. An important feature of these programmes is the involvement of a coordinator responsible for stimulating and monitoring research projects, encouraging the establishment of strong multidisciplinary groups, and promoting the commercial exploitation of the resulting research programmes. Meetings and workshops attended by academic, industrial and Governmental representatives have been held which have led to the identification of priority areas including biocompatibility of materials, adhesion between living tissue and synthetic materials, the development of low-cost devices for measurement and imaging in medicine, and aids for the elderly and handicapped and for the incontinent. Since special attention was first given to the field in 1978 some 190 grants have been made to a total value of five point nine million pounds. The Council's contribution to medical engineering, particularly in supporting research underpinning new developments in medical equipment, was recognised in the recently published report of the Advisory Council of Applied Research and Development on medical equipment.

5. The sub-committee is seeking evidence on nine specific questions. SERC's interest in the overall field of medical research is insufficient for it to comment except in relation to its particular interests identified above. Answers to the questions which seem relevant to SERC are given in this comparatively limited context;

(a) *How are priorities for medical research set?*

In selecting special research initiatives in the basic sciences (paragraph 1) account is taken of the significance of the proposed development (of which an interdisciplinary element may be an important factor) and of a likely substantial measure of industrial collaboration. As is set out in paragraph 3 above, broadly similar considerations go towards the identification of specially promoted programmes, with special emphasis on the element of industrial involvement.

(b) *Is the balance between different branches of research about right?*

In the field of medical engineering the present emphasis given to materials research and to diagnostic techniques is considered to be right. These programmes would probably be protected in the face of a reduction in funding.

(c) *Priorities in relation to changing circumstances.*

An important function of the specially promoted programme in medical engineering is to be alert, for instance by mounting market surveys, to changing needs, and to respond accordingly.

(e) *Are the results of research adequately disseminated?*

Again an important function of the operation of a specially promoted programme.

(f) *How is unneccesary duplication of research effort avoided?*

There are regular interactions between the offices of SERC and the Medical Research Council to ensure that applications for research grants are considered by the Council to which they are appropriate, and reciprocal involvements with various Boards and Committees ensure that Council's policies on matters of mutual interest are consistent. The two Councils may set up joint panels on topics of mutual interest, and MRC representatives serve on management committees of major SERC initiatives when appropriate.

(g) *Is there a need for specific changes in organisation and funding?*

SERC has recognised a need for improved liaison in the matter of medical engineering with Government Departments such as DHSS and DTI, and steps towards this end have already recently been taken. As in almost every other field with which SERC is involved, lack of funds means that many programmes of high quality relevant to medical research must now go unfunded.

6. We are also asked to consider how far the problems identified in the Select Committee's report on Civil Research and Development are applicable to medical research. Again the main thrust of this enquiry is not directed to SERC. The Council has already commented on that report. It agreed with the recommendation (7.7) that Research Councils should as far as practicable harmonise their procedures, criteria and aproaches, and considers that, as outlined in Section 4 above, satisfactory progress in that direction has been made in the present context. As is evident from what is said above most of SERC's interactions with medical research have industrial connotations. The Council did not think it appropriate to respond to section 7.21–7.29 of the report dealing with industrial R&D, but while not passing judgment on the relative merits and demerits of the industries with which it is concerned in this connection, would not see them as needing special consideration within the overall thrust of the report.

Memorandum by Professor J S Scott, Dean of the Faculty of Medicine, University of Leeds

Joint Planning Advisory Committee (Medical and Dental Senior Registrars)

A national committee, with regional Sub-committees, known as the Joint Planning Advisory Committee (JPAC) has been set up by the Department of Health to coordinate arrangements whereby the total number of Senior Registrar and Honorary Senior Registrar posts recognised for higher medical training towards consultant status will be set at a fixed number, approximately in balance with the number of vacancies occurring at Consultant/Honorary Consultant level. (It will at a later stage address Registrar posts on the same basis). Along with this adjustment of total numbers there will be a re-allocation of Senior Registrar posts on a Regional basis equating distribution in relation to population. Honorary Senior Registrar status will henceforth only be granted to University Lecturers, Tutors, etc. when there is a numbered training post available accredited by the appropriate Royal College and within the total approved by JPAC. The national JPAC Committee has recently communicated its recommendations to Region with regard to the first group of medical specialties concerning which it has completed its review.

It is evident that the JPAC review system has major implications for University clinical departments. In some cases the outcome may be seriously damaging. One University clinical department with an excellent reputation locally as well as nationally and internationally for teaching, patient care and research, has as its intermediate grade staffing, three lectureships (clinical) and one tutor (clinical) posts, all carrying Honorary Senior Registrar status which is essential for their duties. The three lecturers have permanent University appointments, however, while the tutor has a four year appointment like a substantive Health Service Senior Registrar. There are only two other NHS Senior Registrar posts in this subject in the Yorkshire Region, making a total of six appointments. The quota now allocated under the national JPAC review is three posts—Honorary and NHS combined. It is almost certain, given the existing distribution of posts, that the University Department will lose at least two Honorary Senior Registrar places. This will mean that whenever a holder of one of these posts resigns, it will not be possible to refill the post in that specialty as accreditation for higher training will not be given. *Furthermore it is not possible for the Department to fill these posts in alternative disciplines as no accreditation exists in other disciplines.* Thus there will be an enforced staff reduction, operating quite independently of UGC economy influences.

Clinical work, teaching and research will all be adversely affected to a serious extent and inevitably this will be proportionately distributed in the reverse order. Other difficulties will ensure. Most current holders of clinical University posts with honorary Senior Registrar contracts in the NHS aspire ultimately to Consultant appointments—honorary or otherwise. However, if, as occasionally happens, and individual

elects to hold his lecturer post on a longer term basis, the Honorary Senior Registrar status is likely to be withdrawn after approximately four years. In that circumstance he would be unable to fulfill his full duties yet would have the right to remain on the University establishment.

For the future it seems that the University will inevitably be forced to offer only fixed-term appointments to lectureships which are associated with honorary Senior Registrar status. Even if a department obtains by its own initiative complete funding for a post, if Honorary Senior Registrar NHS status is appropriate, it will not necessarily be possible to make an appointment.

Although a national quota of Research Senior Registrar posts is envisaged covering the MRC and major charitable medical research foundations plus a small regional allocation, the new arrangement may inhibit appointment of research workers at that level.

In certain disciplines such as Pathology and Microbiology, when we have interviewed candidates who were desirable from an academic standpoint but who had not been quite eligible for "accreditation" necessary for Consultant status, we have been able to give an initial appointment at Senior Registrar level followed by elevation to Consultant level when the criteria laid down by the relevant Royal College had been fulfilled. Two such cases are the subject of requests for Honorary Consultant Contracts at the moment. Unless JPAC is operated with sufficient flexibility to permit such initial appointments at Senior Registrar level in these circumstances, there will be a consequent loss of otherwise good academic candidates.

The DHSS JPAC/exercise is not only out of step with the UGC's funding economies, but there is a profound difference of philosophy. In the UGC's approach, lip service at least is paid to achieving some preservation and development of excellence. The practical effect of the JPAC policy is contrary to this. Departments that are first-class in a particular specialty and have built up a large group of lecturers or similar appointments, funded from different sources, are the ones which are at risk of losing posts.

May 1987

JPAC Effects on Academic Clinical Medicine

The impact of the JPAC Senior Registrar exercise on academic medicine is becoming clearer. The JPAC policies are apparently being applied with extreme rigidity on the NHS side both nationally and regionally and this is having damaging consequences.

Local Effects

At a national level the major problems are arising in relation to medicine as opposed to surgery and other clinical subjects because in this field there is the greatest discrepancy between number of Senior Registrar and Consultant posts. The impact on medicine is proving particularly severe locally. This is related to general medicine having become divided into a variety of sub-specialties (for example gastro-enterology, respiratory medicine, endocrinology, cardiology etc.). Some of these are particularly seriously over-staffed in training grades and greater Senior Registrar reductions are being sought. Both Leeds Departments of Medicine, St James's and LGI, have their honorary Senior Registrar establishment in such over-subscribed sub-specialties and are going to lose accredited posts.

Following a recent Yorkshire Regional JPAC meeting it seems certain that the Department of Medicine, St James's, will lose two Senior Registrar accreditations in gastro-enterology and may lose three. *This relates to a national reduction of five in such posts to a total of 53* and in that light it appears to represent serious injustice. The Department of Medicine, LGI, is scheduled to lose two accreditations in Diabetes/Endocrinology; this again appears excessive against a national reduction of five to a total of 78 posts.

A change in the specialised medical subject of accreditation of the Senior Registrar posts might seem an obvious answer to the problem but this is in practice virtually impossible to achieve.

The problem of increased specialisation within general medicine requires the attention of the University and Health Authorities jointly. Hitherto the University policy has been to fill a Professorial/Head of Department vacancy with the best candidate giving little regard to the field of special interest. For example, Sir Ronald Tunbridge who retired in 1971 from Medicine (LGI) had his main academic interest in Diabetes/Endocrinology. His successor, Professor G P McNicol had an interest in blood coagulation. In turn, *his* successor Professor C R M Prentice has interests in different aspects of coagulation. Despite these two changes in the headship and direction of the Department's activities, its intermediate grade staffing has not been adjusted and all honorary Senior Registrarship posts are accredited for higher training in the field of Diabetes/Endocrinology. Put another way, the University has been paying for a high proportion of the salary costs of the diabetic service in Leeds West although this specialty is no longer the main focus of the Department's activity.

There seem two possible ways of dealing with this—

(a) to accept that a clinical medicine Department's activity must be continued in the same specialised line from one headship to the next, in effect ceasing to be a Department of Medicine and becoming one of a particular medical specialty, *or*

(b) to try to negotiate an arrangement with the Health Authorities whereby the subject of honorary Senior Registrar posts may be changed when a new appointment to headship of the University Department is made, the appointee having a substantially different field of interest from his predecessor.

The former course would have profound implications for the organisation of general medicine academically while the latter would involve considerable health service problems.

JPAC Effects on Academic Clinical Medicine

Enforced Changes in Structure of Academic Clinical Departments as a Consequence of JPAC Senior Registrar Policy

There seems no possibility that the basic aim of the JPAC exercise—reduction in the numbers of Senior Registrar contract holders in over-subscribed specialties with some expansion at Consultant level—will be thwarted. There are major implications in this for the whole structure and future of clinical academic departments which require to be addressed.

In the past it has been the case that most of the research work in clinical departments has been done by staff holding honorary Senior Registrar contracts. The University appointments of holders of this honorary NHS grade have been of various types—for example Tutorships with fixed-term appointments or Lectureships, either fixed-term or with "tenure". However, few Lecturers in the clinical field have exercised "tenure" rights as it is normally understood. Some went on to more senior academic posts but the majority moved to NHS consultant appointments. Many, however, stayed in their Lectureship/honorary Senior Registrarship for a matter of half-a-dozen years, rather than the standard four years of an NHS Senior Registrarship, because of the opportunity it gave to complete a substantial piece of research. Only occasionally has a Lecturer/Honorary Senior Registrar settled in his post, usually pursuing a research line on a long-term basis.

Accepting that the opportunity to recruit clinical academic staff on this basis in the future will be severely restricted in numbers of duration of appointment, what alternative structure can be envisaged? Non-clinicians could be appointed to lectureships but they would not be in a position to conduct anything but a tiny element of the formal teaching, would be unable to contribute to the clinical teaching or the clinical work, for which departments are responsible and could only conduct laboratory research. In a few laboratory-based medical departments (for example Microbiology, Chemical Pathology, etc.) this might be a favoured option but it would certainly not be generally applicable.

Another possibility is to make clinical academic appointments carrying a more senior honorary NHS grading—Consultant or "Associate Specialist". "Associate Specialist" carries with it a stigma of the second-rate and it is unlikely it would attract good quality individuals. Therefore the appointments would have to be at honorary Consultant grade and this change in the ratio of Senior Registrar/Consultant appointments would be in accord with the JPAC philosophy. However, there are a number of difficulties. Firstly, assuming the same resource, the approximate salary differential would mean that only two posts at that grade could be appointed for the loss of three at honorary Senior Registrar level.

Secondly, individuals given honorary Consultant status might expect an allocation of beds, clinics, junior staff etc. thus putting a demand on the Health Authority which would lead them to resist giving an honorary contract at that grade. This can be overcome by arranging that the appointee works within the same clinical base as a more senior individual (for example the Professor) and there are departments with such posts at honorary Consultant level. Providing the arrangements are set out at the commencement of the appointment this type of arrangement can work effectively.

Nevertheless, there would inevitably be a reduction in the numbers of staff and also, with the passage of time, the mean age will rise. It is unlikely that those in the 55–65 year old category will contribute anything like as much to research as those of 35–45 years. Also, the staff remaining would inevitably have more clinical work to do and therefore less time for their academic activities—teaching and research. In many cases the University might have to review its position with regard to continuing the funding of posts which involve a diminished component of academic activity.

July 1987

Letter from Professor S J G Semple, University College and Middlesex School of Medicine, University of London

Thank you for your letter of 7 April 1987 and I am glad to provide a statement on the effect of manpower reductions in the National Health Service on Research.

I would wish that your Committee consider the impact on research of the changes envisaged by the DHSS on medical staffing as a result of the work of JPAC (Joint Planning Advisory Committee) and the results of proposals envisaged in the document "Achieving a Balance" (a copy of the latter document I gave to Mr Slater). I cannot with certainty assess this impact because there are no official statistics provided on the precise changes envisaged. If data is forthcoming your Special Advisers will be well placed to advise your Sub-Committee on the effect on research within the Health Service. However, from the data I gave you and members of the Sub-Committee (copy enclosed) I believe the effect will be substantial and to the detriment of Research in the National Health Service.

What information I have suggests that there will be a reduction of about 1,000 to 1,300 Registrars out of a total of approximately 5,000 Registrars in England and Wales. In the original document, "Achieving a Balance" the compensation proposed was 50 new Consultant posts (centrally funded) and an expansion of Consultant posts at 1–2 per cent per annum. I gather that the original proposal of 50 posts may have been increased to 100 posts. To this must be added a new intermediate service grade; the size of this grade is to increase slowly and would not exceed 10 per cent of the number of Consultants. In addition Regional Authorities have been asked to assess on purely service needs if Registrar posts should be replaced by Consultants when Registrar posts become vacant. There is no evidence that Regions or Districts could afford the financial consequences of such replacements. Regional or District Authorities could advise your Committee on the feasibility of meeting the strain on resources of fully compensating for the Registrar reduction by new Consultant posts. At this stage it is appropriate to mention that some Authorities have had difficulty in funding new Consultant posts even though they have had manpower approval by the DHSS to create new Consultant posts. I would suggest that the National Association of Health Authorities and/or University Hospitals Association might well be able to advise you on the matter.

The reason for suggesting that the changes in staffing structure within the National Health Service is important to your Committee is that these changes will increase the service work load of Senior and Junior Clinical Academic staff (funded by Universities) as well as the corresponding staff employed by the National Health Service. This must reduce the time and energy which clinical investigators have for planning and carrying out research. The impact that reductions in staff which have already occurred between 1981 and 1984 have been published by the University Hospital Association and the National Association of Health Authorities "A Survey of Academic Medical Staffing Changes in the Clinical Medical Schools and (University) Clinical Faculties in England and Wales 1981 to 1984". The general tenor of that report is that reductions in staff has not impaired patient care but has reduced time for research. The effects of JPAC and "Achieving a Balance" will lead to a further fall in staffing levels and thence to a serious reduction in the time available for Research in the National Health Service. A major contribution to research within the National Health Service will be provided by University funded clinical academic Departments. Because of UGC cutbacks in finance, Lecturer posts (Honorary Senior Registrars) have been frozen or abolished which has meant that the time Lecturers devote to service needs has increased considerably, leaving much less time for research and education. This change in job content of Lecturer posts combined with other disadvantages are making a career in Academic Medicine less attractive to those in training. Examples of such disadvantages are (a) difficulty in obtaining research grants, (b) considerable financial loss while away from clinical duties doing research (that is loss of overtime payment, UMTs) and (c) the absence of payment for moving costs on changing appointments.

The medical profession wish to see a solution to the Registrar problem but have consistently pointed out that only by an *appropriate* expansion of the Consultant grade (and probably some SHO posts) can the standard of patient care, education and research be maintained within the National Health Service.

Further information may be obtained from the Association of Clinical Professors (Professor Charles Clark, Rayne Institute, University Street, London). Let me know if there is any further information or help which I can provide.

S J G Semple

April 1987

OPPORTUNITIES FOR CLINICAL INVESTIGATORS AS A CAREER

Honorary Consultants constitute 11 per cent of all Consultants.

Honorary Senior Registrars constitute 20 per cent of all Senior Registrars.

	1981–1984
Net loss of Clinical Academic Staff (expressed as whole-time equivalents)	152
Net loss of Technical Staff	129
Net loss of Secretarial Staff	36

General Medicine: Reduction in Lecturers (Honorary Senior Registrars 111 to 71 (−36 per cent).

Source of information: The National Association of Health Authorities.

The impact of JPAC (Joint Planning Advisory Committee) and "Hospital Medical Staffing—Achieving a Balance"—on future opportunities for medical research are quite unknown. The DHSS has not published figures for medical staffing. The information I have received is as follows:

Approximately 1,300 Registrar posts will be lost (out of 5,000).

Approximately 130 Honorary Medical Registrar posts will be lost (out of 500).

The changes in Surgery anticipated over the next five years are:

Consultant Surgeons will increase from 960 to 1,060.

This will reduce Senior Registrars to 180 and this in turn will reduce Registrars to about 300 (present number 600).

Letter from Mr B T Simpson

1. I wish to appear as a witness before the House of Lords Select Sub-Committee on Medical Research to give evidence on how to implement a cure for cancer and other major degenerative diseases discovered at the University of Surrey.

BACKGROUND

2. There is currently considerable interest in alternative methods for the treatment of cancer which involve a dietary or nutritional component. The only information available in the United Kingdom about some of these methods is contained in books written for the lay public. In the absence of properly conducted trials, doctors are sceptical about these treatments. Anecdotal evidence quoted in the books is, however, of considerable interest to cancer sufferers *and the methods need to be investigated.* Before the protocol for such an investigation can be formulated, it is essential that first-hand knowledge of the therapies is obtained from persons and establishments in which they are being practised. Funds or flight costs are needed to visit such hospitals/clinics in Mexico and Australia. The experience and information gained on these visits would form the basis for independent investigation of the desirability and efficacy of these treatments. There is particular interest in the Gerson therapy for the treatment of malignant melanoma. It is envisaged that funds for such an investigation will be raised through a charity set up for the purpose. This idea has received considerable support but is dependent on obtaining first-hand experience of the techniques. The techniques are usually carried out by the patient and/or relatives and friends, and requires little basic medical knowledge.

3. I should perhaps explain that my involvement in the project arose as the result of the death of my wife in 1984 from Malignant Melanoma (skin cancer caused by over-exposure to ultra violet light) following a tour of duty with the Foreign and Commonwealth Office in Barbados from 1974–78. Initially, I took my wife to the Bristol Cancer Help Centre and it was the "Bristol Experience" as I like to term it that totally changed my life not only from the point of view of diet but also the awareness it gave me in understanding human relationships and why people get cancer. As a direct result of my wife going on the Bristol diet, I achieved a temporary regression of the Melanoma but unfortunately my knowledge at the time was insufficient to save her. After my wife's death in May 1984 at Epsom District Hospital, I undertook worldwide research into cancer on a part time basis whilst continuing my job in the Foreign Office in London and bringing up my two young children aged 12 and 13. Initially, I met with many setbacks particularly as I have no medical or scientific background. However, in 1985 I discovered the first of three women in the world who had actually survived malignant melanoma at the same advanced stage as my wife. All three women had been completely cured of cancer on the Gerson therapy which uses a special juicing machine to produce live enzyme drinks from organic produce. One of the three women Beatta Bishop worked for the BBC and wrote a book about her cure entitled "A Time for Living" obtainable from Wholefoods Book Store, Paddington.

4. Subsequently, Professor Dickerson, Professor of Human Nutrition, University of Surrey invited me down to Surrey University in 1986 to question me about the Gerson Therapy. As a result of my meeting with Professor Dickerson I discovered that his own research into cancer was based on the same therapy and using Vitamin A carotene in juice form as a cure and we joined forces to continue the research.

5. The latest updated position is that I now possess the only juicing machine in the United Kingdom capable of doing the therapy and an engineering firm in Kent on the advice of the Intermediate Technology Group in Rugby are helping me to develop a cheaper manual model for sale to the general public in liaison with the Small Scale Business Enterprise Board in Guildford, Surrey.

6. I think that it is worth mentioning that there are potential benefits to industry and commerce as well *as enormous implications for private individuals.*

7. Finally, I have recently moved to Abinger Hammer in Surrey to a house that has a very large organic garden which Wye College, University of London are interested in developing to help with the cancer research project with particular reference to enzyme technology.

8. I do hope that the House of Lords Select Sub-Committee will let me appear for interview to give evidence since I regard this committee as the ultimate authority for upholding truth and integrity.

December 1987

Letter from Professor R M S Smellie, Institute of Biochemistry, University of Glasgow

I am writing as the head of one of the larger biochemistry departments in the United Kingdom in response to your letter of 3 March on priorities in medical research. My department has an academic staff of 30, just under 100 postdoctoral and postgraduate research scientists and 30 technical staff. The department is responsible for teaching biochemistry to over 1,200 undergraduates, including medical, dental, nursing, veterinary and science students and 60 of the research staff are registered to study for the degree of PhD. There are 10 main research themes as follows:

Molecular Pharmacology	Plant Biochemistry & Molecular Biology
Biochemical Immunology & Parasitology	Membrane Biochemistry
Enzymology & Protein Engineering	Microbial Biotechnology
Control of Gene Expression	Cardiac & Vascular Biochemistry
Biochemical Endocrinology	Neurobiochemistry.

Each of these research themes is supervised by a group of two or three members of staff and has associated with it postdoctoral fellows, postgraduate research students and technicians. Research in progress in each of these areas ranges from very fundamental studies to projects with a direct bearing on patient care and there is very close collaboration between several research groups in this department and a number of clinical departments in the Glasgow hospitals. Projects of direct relevance to the National Health Service include studies on hormone, neurotransmitter and drug receptors with particular bearing on diabetes, hypertension, breast cancer; the production of monoclonal antibodies to tumours such as melanoma and breast cancer, to bacterial antigens including anthrax and brucella, rheumatoid arthritis and other autoimmune diseases; investigations of mechanisms of action of hormones including oestrogens, angiotensin and atrial natriuretic peptide, studies of myocardium metabolism and the preparation of monoclonal antibodies to cardiac myosin; studies on viral replication.

In a large basic science department such as this with strong links to clinical departments and other science departments in the university, both at a teaching and research level, it is important to maintain a thrust in several areas of research. This is essential, not only in maintaining our commitment to the advancement of knowledge across a broad front, but also in the spin off from research to both undergraduate and postgraduate teaching. It is neither practical or desirable to endeavour to conduct research in all aspects of biochemistry and at any given time we endeavour to identify areas of growth and new development which should be given priority and areas of contraction. This having been done we endeavour to deploy resources of manpower and funds to meet these perceived priorities. Over the past 20 or so years since I have been Professor here there has been significant diversification in research interests to take account of important new developing areas of the subject. For example in 1974 a new field of research in Biochemical Immunology was introduced with the appointment of a new professor and this has had a major impact both upon research developments and upon undergraduate and postgraduate teaching. More recently (1984) another major development of this kind occurred with the appointment of a new professor with strong interests in the field of Molecular Pharmacology.

Although departmental policies are a major factor in determining priorities there are many external influences that bear upon this. Some of these are at a university level where the interests of related departments are brought to bear in the appointment of academic staff and in the allocation of internal

resources for research. Discussions between staff of this department and of other scientific and clinical departments are also important in developing new research projects as are discussions that take place at scientific and other meetings. It has to be said that in addition to logical reasoning there is a substantial intuitive input by senior members of staff into the determination of research priorities.

Turning to your nine specific questions I should like to make the following points:

(a) Priorities for medical research appear to me to be determined out of interactions involving relevant university departments and faculties, research councils, charitable institutions, health authorities in both England and Scotland and processes of peer review. In general I believe that because so many organisations and individuals are concerned in influencing these decisions, there can be few major needs of the National Health Service or health needs of the nation that have not been recognised.

For research to be pursued in any of these areas it is essential for there to be a pool of suitably trained staff and the necessary enthusiasm, appropriate accommodation, equipment and facilities and adequate levels of funding. The major problems of the past 15 years have been the declining real levels of resource provision for research particularly from UGC and research council sources. There could be needs for research that are not being adequately met because of difficulties in recruiting suitably trained staff or because accommodation and equipment are lacking, but in many instances these have been recognised and research councils and charities have introduced special initiatives to promote studies in these areas. While there is certainly a place for centralised identification of needs and for research organisations to be invited to make bids for carrying out such research, it would be very dangerous for this process to go too far. New original ideas and concepts often emerge from the thinking of younger less well recognised research workers and too much centralisation of decision making about priorities could stifle originality and initiative of this kind.

(b) Without having overall figures available about levels of support for different branches of research, I find it extraordinarily difficult to judge whether the present balance is right. I am not aware of any special imbalance that I would consider wrong amongst the various branches of medical research presently being conducted in Glasgow. In any event this balance must be to a great extent determined by the interests and judgements of senior research workers in post and their ability to attract staff and resources.

When resources are limited it is all the more important to keep areas of research under continuous review so as to cut back on programmes that may be of diminishing value in order to provide for more important areas to expand. It is relatively easy to recognise areas of research that are desirable, already receiving substantial amounts of support and which might be developed further. These would include, for instance, fields such as cardiology, vascular disease, cancer, virology, immunology, endocrinology and clinical pharmacology in all of which research could contribute to reductions in mortality and morbidity. One good starting point for developing priorities is to consider health statistics. Bearing in mind population trends and instance of disease one area of study requiring high priority at present is that concerned with processes of ageing and associated neurological disease. This is, I think, already recognised but there is some scarcity of resource of trained manpower, accommodation and facilities to tackle these problems and it is only comparatively recently that scientific developments have been such as to make many of these problems amenable to investigation.

Unquestionably the past five to ten years has seen considerable pressure upon research workers to direct their thinking and energies more in the direction of applying basic science to practical problems. While I believe this to be desirable there is no doubt that the balance between applied and fundamental research has moved much more in favour of the applied studies. I believe that we are at risk of going too far in this direction and of so discouraging original fundamental research that the foundations of future applied research will be destroyed.

(c) Seen from my viewpoint there is little doubt that medical research is adapting to changes in the incidence of disease, population structure and new technology. Adaptation to changes in population structure is, I think, lagging somewhat behind adaptation to changes in incidence of disease but as indicated in (b) above this is due at least in part to a scarcity of appropriately trained scientific manpower and to the fact that scientific developments have only recently reached a point at which they can be applied to these problems. Much of the application of new technology in the sphere of bioscience has arisen out of fundamental research in universities and research institutes and in the laboratories of pharmaceutical companies. These have given rise to a new generation of diagnostic and therapeutic reagents and procedures which are widely employed in patient care.

I firmly believe that there is a need to promote the interface between studies in basic and clinical science as, for example, is being done in Professor Weatherall's department in the University of Oxford. The exponential increase in knowledge in both basic medical science and clinical medical science over the past 30 years has been such that it is now quite unrealistic for any one individual to have sufficient knowledge and expertise across the board to embrace all

these new ideas and technologies. There is a real need to promote the formation of interdisciplinary groups composed of clinical scientists and basic scientists to tackle problems in medical research. In my own department, which has many research projects related to clinical problems, there is now not a single medically qualified member of staff with clinical experience. Conversely few clinical departments are now able to devote resources to the employment of staff with basic science qualifications on anything but a short term basis. There is a need for improved career prospects for basic scientists who can work hand in hand with colleagues in clinical departments.

It is moreover becoming increasingly difficult for undergraduates to combine the study of medicine with the study of a fundamental science to a reasonably high level because funding of students studying intercalated degrees is becoming more difficult. This is an unfortunate trend.

At the broader level of the funding of science through the Science Budget it is a disaster that contributions to collaborative international scientific ventures such as CERN and EMBO are so subject to the vagaries of currency exchange rates. It can totally distort support for all other research in this country when, as happened a few months ago, one research council found itself overspent by £20 million for these reasons, but was unable to receive any compensation for this from government sources. It seems to me that if government wishes to play a full part in international collaborative research it must undertake to pay for this in such a way that increased costs arising from currency fluctuations do not have to be borne by other research conducted in this country.

(d) In addition to departmental and university considerations referred to in the introduction another major factor influencing research priorities is the availability of resources. These are drawn from a number of sources as follows:

1. Internal university support from UGC funds.
2. Grant aided support from research councils.
3. Grant aided support from charitable sources.
4. Grant aided or collaborative support from industrial companies.
5. Contract research from industrial companies or government departments.

In the session 1985–86 total expenditure on UGC sources in this department, including academic, technical and ancillary staff salaries, amounted to £1,179,521 and total expenditure from grant and contract sources in the same year amounted to £709,530. In the current year there are about 75 active grants and I anticipate that expenditure from grant sources will be in excess of £1 million and that expenditure from UGC sources will be about £1.2 million. There are grants and/or contracts from each of the five sources listed above.

Very roughly it can be taken that about 30 per cent of the total UGC support for the department is attributable to research activity while 100 per cent of expenditure from grants can be attributed to research. It is evident from this that about 70 per cent of direct expenditure on research is supported by grants and contracts and only about 30 per cent from UGC sources. This, of course, excludes the overhead element of UGC support such as expenditure on university central administration, central services such as libraries, computing facilities, recreational and social facilities, rates, heat, light and electricity and so on.

Because such a very high proportion of funding for research work is drawn from external agencies this inevitably has a major impact on the determination of priorities. No matter what university or departmental priorities are established, research can only be conducted if resources are available in the form of personnel and funding and because of this the policies of external agencies have a major influence on priorities given to research in the department. In general, research councils have adopted a philosophy of supporting relevant and timely research that is likely to reach a successful conclusion. From time to time they may well identify areas of particular priority and a good instance of this at the present time would be research on the AIDS virus. Most charitable organisations have priorities in research that they will support. In many instances these are the *raison d'être* for the charity, but even within their own spheres of interest charitable organisations may identify particular objectives that merit priority.

In the case of both research councils and charitable organisations determination of priorities arises out of consideration by the senior scientists who comprise the advisory committees of these organisations. These individuals are generally drawn from a pool of distinguished scientists of national and international reputation who can be relied upon to have detailed knowledge of the way in which research has been developing in their own fields and is likely to develop in the years ahead. Most of the larger charitable organisations such as, for example, the Wellcome Trust, the Cancer Research Campaign, the Nuffield Foundation, the British Heart Foundation or the Wolfson Foundation, operate advisory committee structures similar to those of research councils and both the research councils and the charities make use of external experts in particular fields to assess the merit of any proposals for research support. There is a substantial degree of cross-membership of these committees and of communication between the various organisations that support research. This helps to avoid undesirable duplication of effort and assists in the determination of priorities.

Superimposed upon the research councils is the Advisory Board for the Research Councils (ABRC). This body is much concerned with general policy matters but from time to time the ABRC also identifies fields of research that require to be given higher priority and it serves to some extent as an over-arching body for the activities of the research councils.

It would be difficult to envisage a more appropriate network of committees for guiding the priorities to be given by all these organisations in the allocation of funds for research.

So far as industrial companies are concerned support for research is in general determined, to a considerable degree, by commercial considerations. Decisions as to priorities by companies are also influenced greatly by their own scientific staff and the facilities and resources available to them. In many instances they do seek advice from external consultants but clearly their priorities are largely determined by factors relating to the best interests of the company itself.

Contract research for government departments tends to be set up in a somewhat similar way to contract research with industrial companies.

From what I have said you will appreciate that there are very many factors influencing a head of department in decisions about priorities for the conduct of research within his department. Many of these are welcome and I believe that a head of department who takes heed of all these influences and sources of advice and is able to superimpose on them his own judgement and intuition as to the special strengths of his own department will arrive at effective departmental research priorities.

(e) Generally speaking the results of research are adequately disseminated both at scientific meetings and in scientific journals. It has to be said that one consequence of restricted funding for universities in recent years has been very tight limitation on funding for members of staff and research workers to attend scientific meetings and to visit other research groups. I believe this to be a false economy which may give rise to unnecessary duplication of effort and certainly reduces the extent of quick communication amongst scientists working in similar or related fields.

(f) Some degree of duplication of research is desirable. There are instances of observations made by a single group that have never been confirmed by any other group but which for no very good reason are either accepted as gospel or regarded as suspect. In any event a single group tackling a problem may overlook or fail to recognise certain important aspects of the problem or different approaches to it. Clearly direct duplication or repetition of work is to be avoided but I think existing mechanisms or peer review allow a reasonable balance to be reached between desirable and undesirable duplication.

(g) In my opinion developments in research are reflected in improvements in patient care and in health education. Particularly in a basic science department such as this the most recent advances in research are conveyed to students within a very short time scale. This is indeed one of the reasons for university staff requiring to engage in research at the forefront of their own specialisations. The interval of time between a research conclusion being reached and the application of that conclusion to patient care can vary considerably often depending on the conduct of appropriate trials and upon approval by the Committee on the Sale of Medicines (CSM). While in some instances there have been long delays these have usually been in the interests of establishing efficacy and safety and I would find it difficult to identify a specific instance of undue delay in the translation of any major research discovery to actual patient care or health education.

(h) Training of medical researchers is a continuously evolving process requiring flexible approaches on the part of both clinical and basic scientists. Over the years in my own institution I have observed ever increasing flexibility by both groups and willingness to embark upon collaborative research.

While I would not subscribe to the concept that all medical students should be trained to honours degree level in some scientific discipline, I believe that the progress of medical research has been, and will in future be, strongly promoted if there is a cadre of individuals who are so trained. The proportion is open to debate and obviously depends to some extent upon the ability and enthusiasm of students to undertake such training. For my part I would consider it desirable for perhaps 10–15 per cent of medical students to have received a training to honours degree level in one or other of the related scientific disciplines. Experience over many years suggests that it is not difficult to find this proportion of medical students who will benefit from, and are willing to undertake, this more extended training.

At present intercalated degree students domiciled in England and Wales are funded by the Medical Research Council and in Scotland by the Scottish Education Department. In recent years the Medical Research Council has come under increasing criticism for funding intercalated degree students and this may also percolate through to the Scottish Education Department. This is a most retrograde development which discourages good students from embarking on such studies and the willingness of students to undertake this more extended training is also

beginning to be influenced by fears about their future career prospects and the perceived need to embark at as early an age as possible upon the professional training ladder.

(i) While it cannot be denied that the pressures arising out reduced UGC funding for universities in recent years have forced university departments to give more careful consideration to their priorities in both teaching and research, it has concurrently imposed an enormous bureaucracy upon departments both in relation to their own institutions and in relation to external funding. My own freedom of action as a head of department in allocating resources has diminished dramatically over the past five years and virtually every decision of any substance now requires approval of one or more committees. The decrease in basic levels of funding from the UGC has made it necessary to seek external funding on an ever increasing scale. This further reduces one's ability to determine one's own priorities but additionally an increasing proportion of time and effort by active research workers is now having to be devoted to fund raising activities. Over the period from 1970 to 1986 the real value of funds available from UGC sources for consumable materials in this department has fallen to about 50 per cent and funds for equipment to about 20 per cent. Over the same period the real value of expenditure from grants increased by 200 per cent. To achieve this has required that as a whole this department submits somewhere between two and three grant applications every week throughout the year. At a very rough estimate this is equivalent to between 10 and 20 per cent of total academic staff time.

So far as university funding for research is concerned the extraordinarily short planning horizons that have applied in recent years make forward planning of research extremely difficult and very inefficient. This is a particularly important factor in relation to the recruitment and retention of suitably qualified research staff. Recent months have also given rise to comparable problems in funding from at least some research councils who, because of inadequate funding, first of all had to cancel and later reinstate particular rounds of consideration of grant applications. I cannot emphasise too strongly the adverse effects of this continuous process of stop/go that we have experienced over the past decade. The effects of this on staff morale are becoming increasingly serious, perhaps most serious of all in the longer term is the effect that it is beginning to have on new young research students in whom one begins to see serious disillusion about the future prospects of a career in scientific research in the United Kingdom.

One area of research that presents me with particular problems is the interface between the results of fundamental studies and the translation of these into reagents procedures or techniques that may be applied in practise. Often proposals in this area fall somewhat outwith the remit of research councils. Because of reductions in university funding it is now less easy to fund such studies from UGC sources and only in certain cases have we been successful in attracting funding from Health Service sources. This tends to lead us into negotiations with pharmaceutical and related companies. While in some instances we have had good experiences in such approaches there have been others in which our experiences have been very unsatisfactory when, for example, as a consequence of change in company policy, work in progress has been terminated at very short notice or a contract has failed to be completed at a late stage in negotiation. It is difficult to see how best this gap could be filled. As presently structured I am not sure that the research councils are the most appropriate bodies to consider such projects but on the other hand industrial companies are likely to have vested interests. More ready access to Health Department funding by basic science departments such as my own could be beneficial particularly in relation to medical research applicable to patient care.

You ask to what extent the problems identified by the Select Committee on Science and Technology—Civil R&D First Report 1986–87 (HL20–I) are relevant to your enquiry. Clearly that report dealt more generally with the whole of Civil R&D and it will be evident from my remarks above that many of the conclusions and recommendation contained in it apply equally well to medical research. I would myself endorse recommendations 7.5, 7.6, 7.8, 7.9, 7.10, 7.11, 7.12, 7.15, 7.17, 7.18, 7.22, 7.23, 7.24, 7.25, 7.28, 7.30, 7.31, 7.34, 7.37, 7.38, 7.39 and 7.40.

Much of what is contained in the report on Civil Research and Development is directly relevant to medical research and I think it important that medical research should not be regarded as something separate from other Research and Development. Having said this, however, there are special aspects of medical research that are not ádequately dealt with in the report on Civil Research and Development. Special features include relationships between the Health Departments and the research councils, relationships between clinical medical scientists and basic medical scientists, the relationship between professional training, the various colleges and medical research, the relationship of both basic and clinical research to the care of patients, the role of research in pharmaceutical and related companies and their relationships to clinical research, basic research, the CSM and the NHS. Otherwise I firmly believe that medical research should be seen as a subset of Civil R&D and not something to be set aside from this.

I hope you will find these remarks helpful.

April 1987

Memorandum by the Society of Occupational Medicine

The Society of Occupational Medicine is grateful to the Select Committee for the opportunity to comment on medical research.

We note that your main concern is with priorities in medical research. In this connection the Society has a Research and Development Panel which has been in existence for some years, and which has sponsored a number of symposia at which research topics of current interest and importance have been discussed. A number of publications have resulted and I am pleased to enclose copies of some of these for the Sub-Committee's perusal. The topics are selected, after careful consideration by the Panel and with the guidance of the Council of the Society, as being of most interest and concern to Members. We believe the Symposia may have influenced priorities in research through their effect on individual participants.

Regrettably the resources available to the Society do not allow direct involvement in support of research projects.

As regards medical research in industry, this tends to be practical and applied in its nature, in response to problems as and when they arise. Furthermore, many of the problems are specific to particular industries, being dependent on particular commercial processes.

The Society is not aware of any mechanism within industry which sets priorities in medical research, but it is recognised that Government Departments (for example, Health & Safety Executive) and the Medical Research Council have committees which overview the field, and their membership includes Members of the Society.

With the satisfactory control of a number of the older, classical occupational diseases, a higher priority should now be given to those conditions of multifactorial aetiology that may be aggravated by the working environment, although originally determined by non-occupational factors.

Such research as is undertaken is funded from a variety of sources (for example, Government, industry groups, individual companies). On occasions work is carried out in cooperation with universities or the Medical Research Council and sometimes funded by these bodies. The Society believes that the results of research are adequately disseminated through professional meetings (such as the ones the Society sponsors twice yearly) and in the medical journals, such as the Journal of the Society of Occupational Medicine. We have pleasure in enclosing a copy of a recent issue for the information of the sub-committee.

The Society believes that both the training and resource allocation for research into the causes and determinants of disease, in particular in the field of occupational and environmental health, are inadequate. Research techniques should be an integral part of the training of occupational physicians. Greater emphasis should also be placed on epidemiological methodology in the training of medical research workers in this field. A national framework is required for epidemiological surveillance and research to ensure the earliest possible detection of occupational hazards. There is a need for a more detailed assessment of both occupational and general environmental exposures, and for the recording of these in a standardised manner.

In summary, the Society is formed of occupational physicians whose collective experience of medicine in the workplace and of research is considerable. While the Society has no resources of its own to fund research, it is well placed through its membership to give advice on priorities in research. At present, no mechanism exists for the Society to do this. Should the occasion arise, the Society would welcome the opportunity to be more involved in such matters.

Memorandum by the Society for Social Medicine

1. The Society was founded in 1957 and has the object of promoting "the development of scientific knowledge in social medicine . . . defined as epidemiology, the study of the medical and health needs of society, the study of the provision and organisation of health services and the study of the prevention of disease". The membership of the Society is now about 750 and is drawn from a wide range of academic disciplines; they include epidemiologists, sociologists, social psychologists, health economists, statisticians, experts in health information systems, and health and social service administrators. Their common interest is that their work is contributory to the objectives set out above.

2. The members of the Society come primarily from academic backgrounds and meetings of the Society provide the principal forum for the academic discussion of matters relating to its objectives in the United Kingdom. In recent years, there has been an increasing rapprochement between these academic interests and matters that are of more immediate relevance to the provision of health services; this trend is reflected in the increasing number of members (from all disciplines) who are employed in government or the National Health Service. It also means that the Society's members comprise a large proportion of that

cadre of research workers who are engaged in activities pertinent to the Sub-Committee's present field of interest.

Research and the Public Health

3. Before addressing the specific questions posed by the Sub-Committee, it will be helpful to comment briefly on broader issues that will provide a context for the answers we provide. In summary, the Society's interests are with those activities which are likely to improve the health status or experience of the population (or of groups within it) and so the research undertaken by its members divides into three main areas of work. These are, first, enquiries that might elucidate the underlying processes of disease causation (illustrated, for example, in the association between cigarette smoking and lung cancer or heart disease); second, studies of the relationships that may exist between social or environmental factors and the experience of health (as, for example, in the current debate about inequalities in health); and, third, research into questions that concern the effectiveness of either health services or other aspects of social policy in reducing the incidence of disease or minimising its consequences.

4. In the practical world, these divisions are rarely clear-cut. The traditional concerns of the Public Health movement were with the physical environment and with such matters as the control of infection. In contemporary society, the major determinants of ill-health are more complex and arise largely as a consequence of social or demographic change or from the social, economic or behavioural attributes of different social groups. One implication of this statement is that successful research into these matters is dependent on a combination of the skills of different disciplines and on experience of their application in this field. Social Medicine is a discipline with its own theoretical perspectives and approaches but it is one that also draws on other areas of research and seeks to relate developments within them to an understanding of ways that the health needs of the population may be met.

5. The National Health Service (NHS) is, of course, a complex organisation with diverse social purposes. In addition to the function of providing different kinds of medical care for the individual citizen, the NHS can also be regarded as offering one means of influencing or improving the health of the population as a whole. The opportunity for doing so may sometimes have a quite specific form—such as the implementation of screening programmes for different cancers—but it is also possible to consider this "public health" function in more general ways. (A current example concerns policies for the community care of the mentally ill and their implications for the provision of health services in the community.) Although the Society's members contribute to the solution of health service problems in a number of different ways, it is in terms of the effectiveness of services as a means of improving the health of the population that their activities have their primary focus.

6. We would argue that research with this perspective is important for two reasons; the first is that if the planning of health services is to be more than responsive or reactive, then it is necessary to monitor changing patterns of health and illness and to have an awareness of how different strategies of health services investment and management might influence them. This is a requirement for the epidemiological study of the occurrence of disease—including change over time—but it must be linked to knowledge of the ways that the social and behavioural attributes of groups within the population contribute to the outcomes we can observe.

7. Our second argument rests on the distinction to be made between the effectiveness of health service activities (in the sense of inducing changes in health status) and the efficiency of their application. In recent years there has been a tendency to emphasise the importance of the latter as evidenced by the introduction of the system of "General Management" and there is, of course, a good case to be made for research into many such aspects of the efficient use of health service resources. It will be apparent that a concern with efficiency cannot be separated from the issue of effectiveness when this is interpreted in the broader light of consequences for the health of the population as a whole and not simply in terms of the outcomes of specific procedures or activities. The relationships between "health" and "health services" are complex and are not easy to summarise succinctly; the intellectual skills and perspectives of the Society's membership are directed towards their elucidation and thus provide a context for understanding more narrowly defined concerns with the efficiency of service delivery.

The Context of Research in Social Medicine

8. Before addressing the specific questions posed by the Sub-Committee, it may be worth commenting a little further on aspects of the research process within Social Medicine. Research workers in this field do, of course, assemble their own data by such methods as population surveys but they are also dependent on two other sources of information. One is a long-standing tradition of the analysis and interpretation of data (such as that pertaining to mortality) that are gathered as part of the Governmental statistical system largely—although not wholly—within the purview of the Office of Population Censuses and Surveys (OPCS). The second is the use of routinely generated NHS data which are of value in a number of ways but not least in the "case-finding" activities which are central to epidemiological research. It has been suggested in the past that much of the internationally recognised strength of British epidemiology derives from the quality of these sources of basic data.

9. We introduce our more specific comments in this way because the future development of research in our field—especially for the purposes we sketch above—will be as dependent on the support of these activities as on research funding *per se*. There has been a tendency in recent years to regard both governmental statistics and the information systems of the NHS as serving short-term "management" interests; it is important to appreciate that it is often the secondary analysis of these data, commonly including their review over quite long periods of time, that provide insights into the changing pattern of the Public Health. We regret what appears to be a short-sighted view of a system of public information that stretches back into the last century.

10. This last comment leads us to two major areas in which we think that the present situation is seriously deficient when regarded either in terms of public information or of more formal research studies. These are, first, inadequate measures of morbidity (ill-health) in the population and, second, a clearer understanding of the relationships that may exist between health or ill-health and what we might summarise as the quality of life. The two are important in a number of ways but the principal one is that measures such as mortality rates are no longer wholly satisfactory as reliable indicators of the health status of the population. This is especially so in regard to understanding the need for health services of different kinds. The problem is overcome to some degree by activities such as the General Household Survey (OPCS) or by specific research studies but these alternatives provide only a very patchy outline of the nature of health needs and problems as they exist in different population groups. It is these same needs and problems that provide a measure of the tasks of the Health Service; its ability to satisfy them is the starting point for strategic planning and is the basis of measures of effectiveness.

11. If one is concerned with the effectiveness of services in this sense of improving the quality of life, it is necessary to take further account of the ways that health service programmes "reach" different population groups. These are arguments for research into the effectiveness of service delivery as it relates to changes in the health of population groups. (As an illustration, the question of whether recent changes in mental health policy have improved the health of the mentally ill population is not one that can be answered adequately by the local study of particular services.) In our view this is a dimension of health services research that has received too little attention and yet it is one that applies equally to specific clinical programmes and to such wider topics as health education policies. Epidemiological monitoring is a necessary part of the appraisal of services but this is also an area in which the social sciences make an important contribution to understanding the interface that exists between services and those who have need of them.

12. The various arguments we have made up to this point combine to suggest that the relevance of Social Medicine research to the National Health Service is primarily that it provides insights into the social or environmental mechanisms of disease causation or progression and that it is from such understanding that monitoring or oversight of the strategic priorities of the NHS can best be judged. Within this perspective, there are ways in which the discipline contributes applied research that bears directly on the immediate policies and practices of the NHS but there is an equal requirement for more fundamental areas of research, including that which proposes new investigative methods, as a part of this overall activity. Our specific answers to the questions below derive from this more general standpoint.

THE SUB-COMMITTEE'S LIST OF QUESTIONS

(a) *"Priorities for medical research"*

(b) *"Is the present balance right?"*

13. Financial support for research in Social Medicine is largely found from three sources; from the Medical Research Council (MRC), from the Health Departments (DHSS and SHHD) and from the research budgets of Regional Health Authorities (RHA) or their equivalents. Some relevant research may be funded also by the Economic and Social Research Council (ESRC). Although we have no firm information on the point, our impression is that only a very small proportion of research funding in our field is found in the private—charitable—sector. An exception is the impressive record of the Nuffield Provincial Hospitals Trust.

14. At a formal level, the priorities of each agency tend to reflect their own view of the field at a particular time and, since these are different, it is difficult to argue that there is an explicit consensus of "priorities" in the way that the Sub-committee's question might suggest. We have been concerned, however, by a recent tendency on the part of the Health Departments to emphasise the political or administrative content of the priorities they identify; this trend does, of course, have important implications for research in fields such as ours. The lack of consensus is mitigated to some degree by the fact that most research funding is the subject of careful peer review within the field (with the effect that co-ordinated effort may be greater than it appears on the surface) and by the fact that it is possible to think in terms of a "research market" which, in a fairly small academic community, means that *perceived* priorities in a particular topic area are probably fairly well disseminated. We might note that the peer review process applies principally to the assessment of the research proposals that come forward. Researchers themselves have a lesser voice in the setting of wider priorities but could usefully contribute to this activity partly by identifying larger-

scale issues (such as those we indicate above) and partly by bringing realism to discussion about the ways that the potential of research can best be exploited.

15. There are two ways in which present arrangements act against the emergence of longer-term strategic priorities in this field. The first is that the discipline is not separately represented in the Board structure of the MRC with the consequence that population perspectives (and especially those relating to the NHS) form only a part of the priority-setting criteria of these different Boards which may thus reflect rather different objectives. Secondly, the research priorities of DHSS are likely to concern issues that have to do with more immediate questions that arise from the NHS as it is now. This is likely to generate research that can be applied to recognised problems of service provision. It should be said that both agencies do fund research that is germane to the development of the discipline as a whole but there is also a sense in which the concerns of Social Medicine as we sketch them above can fall between the two stools of "applied" and "academic" research with a consequent lack of overall coherence. As in other disciplines, good research in Social Medicine is dependent on the ability to develop programmes of work which have continuity and in which questions of immediate interest can be linked to a more fundamental appreciation of the issues involved. Present funding arrangements have their most serious effect in the support of research groups that are able to pursue their work in this way.

16. Solutions to this problem are not easy. There have been debates over several years leading to a concordat between the MRC and DHSS in the matter of what is sometimes called Health Services Research. Up to the present, these arrangements have not greatly altered perceptions of either priorities or funding opportunities. There are good arguments for creating a further division of the MRC in which aspects of population medicine together with *some* areas of health services research (those concerned with strategic issues) have separate financial provision made for them. This proposal, however, would need to take account of both the need to include epidemiological and other research within other scientific programmes of the MRC and of the Health Departments' own needs for the "problem-solving" research we note above. Whatever the solution, we would argue the need for a greater emphasis on epidemiological and social science research which can be defended in its own terms and which is not as subject to external criteria of relevance as may be the case at present.

(c) *"Are priorities changing . . .?"*

17. Our brief answer to this question is "Yes—although slowly". Developments in either medical practice or, more widely, health services practice, may arise as a consequence of improved technology (for example, a new technique or a new drug) but they may also occur as the result of changed insights or understandings of good practice (as evidenced, for example, in the current debate about hospital or community care). In these contexts, research may be about the implementation of "new methods" but it should also concern the need to monitor changing approaches to the provision of care and the consequences they may have. Research in this latter area often requires to be conducted over fairly long time-scales and may include the need for the measures of morbidity and quality of life we note above. There is current research of this kind but it is an approach that is less easy to fund and may be neglected on this account.

(d) *". . . the influence of funding institutions . . ."*

18. At the level at which proposals for research are assessed, funding agencies in the public sector are very largely aggregates of other research workers so that the success of new proposals is very dependent on the process of "peer review". There are obvious merits in such a system not least because judgments as to the technical quality and relevance of research proposals are often difficult. On the other hand, it is also likely that such a system will emphasise the corporate ethos of those making these judgments with implications for the kinds of work that are funded. Given that Social Medicine research may potentially fall between various funding agencies (DHSS/MRC/ESRC/RHA) two consequences are possible; either that the research may satisfy the orientation of none of the agencies or, more probably, that the proposal may be "tailored" in ways that will improve the likelihood of success with one or other agency.

19. Earlier, we used the term "research market" to suggest that the actual process of funding research will comprise a complex interaction between the signals given by the agencies and their perception by researchers. In this sense, research that is thought appropriate for MRC funding will be approached in different ways to work that is seen as attractive to DHSS interests. For Social Medicine, the danger in this kind of division is one of creating an undesirable distinction between "basic science" research and research that is close to immediate issues of policy; in such a division, the middle ground of studies that might provide a more satisfactory contextual basis for applied research is less well accommodated.

In making these comments, we would draw attention again to the importance of OPCS and NHS information systems as sources of research data. Priorities for the financing and management of these systems are similarly influential in the successful conduct of research into health policy and its consequences.

(e) *". . . the dissemination of results . . ."*

20. In our view, the results of research are well disseminated *to researchers* in a range of scientific journals and at meetings of both research workers and NHS staff. In terms of NHS policy, one must recognise that individual research projects rarely answer a "whole question"; the results of research are

more likely to be cumulative in their effect on the understanding of a particular policy issue so that an on-going dialogue between researchers and practitioners (in such activities as scientific meetings and study-days) is an important part of the process of dissemination. Our view is that the present dialogue could be more actively promoted and that there is scope for improvement in the implementation of research findings by those who are responsible for the management of services or for clinical practice.

(f) *". . . duplication of research effort . . ."*

21. Much of the applied research in this field is, of necessity, closely related to the setting in which it is conducted; in this regard it differs from the more closely controlled experiments that are possible in laboratory settings. This means that there is often a need to replicate epidemiological or health services studies in other contexts. In an ideal world, there would be a case for the greater coordination of applied studies within a particular field (that is, a more focussed approach to larger research objectives); in practice, the system of peer review we mention above goes some way towards this end. Because the senior research community is small, it is likely that duplication of research both within and between agencies is avoided in this way.

(g) *". . . improvements in patient care or health education . . ."*

22. We have commented above that the results of research are more likely to influence the understanding of policy issues and the ways that services are provided rather than lead to immediate changes in practice. If this is so, research will contribute in the shorter-term as simply one element in the day-to-day process of management. In this analysis, one might identify research that is contributory to the "strategies" of health service provision (such as the implications of demographic change), to the tactical response to these strategic needs (defining appropriate services for the elderly) and to the ways in which the response may be brought about (the re-allocation of appropriate resources). We have referred earlier to the need for a greater emphasis on the first of these three levels of approach when research might take a number of forms; the example above relates to descriptive epidemiology but one might equally well argue a case for basic research in the behavioural sciences which would underpin the practice of health education.

23. As researchers, we might add that there does seem to be a gap between research findings and their implementation in health services practice. As we indicate above, implementation is a complex matter and is one that relates more properly to the management system of the NHS than to research itself. One deficiency in the present research field may be a lack of sufficient work in the area of health services management and, more specifically, into the processes of innovation and change. As an illustration, we might comment that there have been few studies which have sought to evaluate alternative ways of structuring, organising or managing health services from the standpoint of the effective provision of care to the population.

(h) *". . . priorities in the training of research workers . . ."*

24. Research in Social Medicine requires knowledge and understanding that is drawn from several other academic disciplines. These include epidemiology, statistics and the range of the social sciences. It is for this reason that most groupings of researchers in the field are multi-disciplinary and much successful research has this same mixed character. The training of workers in Social Medicine, therefore, has two main components; one is a period in which they are able to translate or apply the content of their initial disciplinary education. The second is a need to gain experience of the field, and of the relevance and application of the other contributory disciplines.

25. Formal courses have value in meeting initial post-graduate needs, but research training that satisfies the criteria we note above must be largely experiential. Frequently, this means the employment of junior workers as a part of funded research projects, commonly for periods of about three years. In many ways, this is an appropriate mode of training and we think it is the case that more senior members of the research community can provide required experience in this way. Difficulties arise because, outwith formal University posts which are now scarce, there is no clear career progression for research workers within a particular topic area and thus (except for a fairly small number) no longer-term way in which an appropriate cadre of experienced research workers can be developed. In a climate of tightly constrained funding, this problem may be accentuated by preferring junior rather than senior workers simply as a way of funding research more cheaply.

26. Although not strictly research, there is an interchange in the employment of younger workers between academic settings and the NHS which is increasingly recognising the need for their skills in such areas as service planning. For some, further opportunities may be provided in the Research Units supported by both the MRC and the Health Departments. By and large, however, there is no clear pattern of career development in health services research and a tendency towards a cohort of "jobbing research workers" who move from project to project as opportunities arise. This situation compromises the quality of the research that is possible; solutions are not easy but there are strong arguments for examining ways that will satisfy the need to both train and then support experienced workers in this field.

CONCLUSION

(i) *". . . changes in the organisation or funding of research . . ."*

27. In our answers to earlier questions, we have said that research in the broad field of Social Medicine can range across activities that fall within the "basic science" concerns of the MRC to applied health services research of interest to the Health Departments or to Regional Health Authorities. The discipline's concern with the health of populations means, however, that these different "categories" of research are not separate in practice and that each is necessary to the other. Towards the centre of the range, there is an area of research that will be more concerned with monitoring change in the health needs of the population and with the strategies for health services provision that are thus appropriate; we have suggested that these are topics that may fall between the interests of present funding agencies.

28. In our understanding, it is research of this character that should be supported by the "concordat" arrangements of the MRC and the Health Departments but our impression is that this scheme has not yet evolved to the stage where its purposes are well perceived by the research community. One change in present organisational arrangements, therefore, might be the setting up of a new Board—or division—of the MRC with a specific concern for research into aspects of population health. Funding for such a division might be found jointly by both the MRC and the Health Departments but its creation need not preclude support for appropriate research from other MRC Boards or, for matters relevant to immediate policy, from the Health Departments.

29. Our second major comment concerns the need we discuss above for a cadre of experienced research workers who are able to describe and analyse changing patterns of health and the effects of Health Service policies. Traditionally, these are activities that have been undertaken by University Departments of Community Medicine but recent changes in University funding and additional commitments of other kinds raise doubts as to whether this requirement for research can continue to be satisfied in this way. Such academic Departments will continue to have an important role but one might also argue the need to clarify the longer-term issues that are of relevance to health services and the organisational arrangements (including the need for a proper career structure) which will address them. The framework for doing so exists in part in the series of research Units established by the Health Departments in the past 10–15 years although policy as to their collective purpose remains unclear.

30. The Society would welcome the opportunity to elaborate further on the evidence set out above if the Sub-Committee considers that it would be helpful for it to do so.

May 1987

Memorandum by the South East Thames Regional Health Authority

INTRODUCTION

Medical research covers a bewildering and complex range of investigative and scientific activities. It can be conveniently divided into three major areas of enquiry.

(1) *Biological or biomedical research* which investigates the fundamental biological mechanisms in normal or diseased tissue in animals including man. This research is mainly conducted in university departments and is within various academic departments such as genetics, biochemistry, physiology or molecular biology. Such research can also be initiated within the commercial or industrial sector or may be transferred there when larger scale development is considered clinically or economically viable.

(2) *Clinical research* is the application of scientific biology to the manifestation of illness (including its diagnosis) or to its treatment in man. This research is the domain of clinicians, particularly academic clinicians and requires the opportunities for patient care and various other means of supporting scientific investigation.

(3) *Health service research* has been defined as the systematic study of the means by which medical and other relevant knowledge is brought to bear on the health of individuals and communities under a given set of conditions. It is difficult to define the limits of health service research for the activities which it examines often intersect with other areas of research. Roughly speaking, health service research examines issues concerned with health service process, resources, effectiveness, organisation or personnel.

In general the primary area of concern in this type of enquiry is with the mechanisms and results of care, rather than with matters directly relating to the disease process itself; although it is obvious that sometimes health service research cannot be isolated from purely clinical or biological enquiry.

Our submission addresses itself to the questions raised by the Sub-Committee of the Science and Technology Committee of the House of Lords *only as they relate to health service research.*

THE DEVELOPMENT OF HEALTH SERVICE RESEARCH IN THE UNITED KINGDOM

The evolution of this field of enquiry as a distinct research entity has been gradual and it wasn't until the early 1960s that the Department of Health and Social Security clearly declared itself interested, in the sense used above, in its own activities. As Dr Cohen indicates in his essay about the role of the DHSS involvement in health service research (Cohen, 1971),[1] there has never been an explicit division between the Medical Research Council (MRC) and DHSS in respect to health service enquiry; but from the introduction of the NHS the major role in "medical service" research was affirmed as the responsibility of the Department of Health.

The beginnings of the Department's involvement in research activity were piecemeal and enquiry was organised by individual branches and relied partly on personnel recruited to the Department or NHS and partly on work contracted to outside institutions.

However, by 1966–67 expenditure on Research & Development has risen to £750,000. To cope with this increasing commitment, a Research & Development Committee was formed and a Research branch consolidated within the Department itself. In retrospect it is difficult to determine clearly to what degree the research programmes sponsored by the DHSS with this money were actually generated from enquiry within the Department itself. With the exception of some special areas, it does seem that ideas for the majority of projects (if not the majority of money) arose from interested persons outside the DHSS.

In 1971 the Rothschild Report[2] appeared. It recommended that an increasing proportion of government research funds should be directed into research work commissioned from the outset by the DHSS and directly concerned with general operational issues and policy making within the health service. The acceptance of this approach further increased the DHSS's financial involvement in research and ensured its position as a near monopoly employer in health service research.

From the outset the DHSS recognised that it would be unable or unwilling to recruit research workers within the civil service except for a small number of specific areas such as operational research. It needed to rely on outside bodies such as universities to provide the organisations, the personnel and much of the direction of this research effort.

The involvement of outside institutions, both university and others, can be traced in the official publications—particularly in the yearly DHSS Handbook of Research and Development from 1975 onwards. As suggested earlier, the main method chosen by the DHSS in developing its research capability has been to finance groups of research workers within health service research units. These units are mainly in or attached administratively to pre-existing university Departments of Social Medicine, Social Science, Operational Research Economics or Statistics. As such they are usually directed by persons who hold full-time academic appointments in their own right and were mainly in post before the units' creation. Thus the director is often part-time in the sense that he has additional commitments for which he is responsible outside the research programme.

The DHSS has created contracts with these persons to carry out research and for this purpose funds are provided to enable other personnel to be employed on a limited tenure or contract; in some cases pre-existing MRC units are used in this way. The degree of commitment by DHSS to these units varies considerably. Some are staffed almost wholly by DHSS funded workers; whilst others have few personnel, perhaps two only, on these terms—and these departments have maintained their university departmental structure completely separated from any Health Service Research commitment with the DHSS. In a small number of cases the DHSS has created units *de novo* without attachment to pre-existing university departments.

Although support for some units has now been withdrawn and new ones have been established, the mechanism remains essentially that developed after the Rothschild Report:

(i) *The Office of the Chief Scientist* in the DHSS, now called the Division of Research Management, administers the research budget and provides liaison between the Research Liaison Groups (DHSS) divisions and the nominated outside research units.

(ii) Customers' interests and priorities within the DHSS are partly determined by *Research Liaison Groups* covering a particular field such as mental illness. They do not, however, consider spontaneous applications for funding; previously these were the responsibility of the Small Grants Committee but this body has now disappeared. Each Research Liaison Group covers a particular field of research and includes DHSS policy makers and research management staff, scientific advisers appointed by the Chief Scientist and, in most cases, service advisers (doctors, nurses and social workers) representing the interest of the NHS and local authorities, by whom they are nominated. There are serious omissions from the range of topics covered, of which the most notable are the acute services.

[1]Cohen R H.L, 1971. The Department's Role in Research & Development. In: McLachlin G (ed), Portfolio for Health, London, Oxford University Press for the Nuffield Provincial Hospitals Trust, 1–21.
[2]A Framework for Government Research and Development (Cmnd 4814), London, HMSO (1972).

(iii) In addition to the Research Liaison Groups, *Divisions* within the DHSS can and do directly contract-out research work. There appears to be some notional allowance within divisions for research funding but this may be within the research budget administered by the Division of Research Management.

(iv) Liaison of the DHSS with the *Medical Research Council* which agreed to increase expenditure on Health Service Research up to £2,000,000 by 1985–86.

SELECT COMMITTEE QUESTIONS

It is now appropriate to address the questions raised by the Sub-Committee of the Select Committee on Science and Technology of the House of Lords as these relate to health service research. It is worth noting that there have been two departmental enquiries concerned with health service research in the last five years. In 1982 the DHSS issued a report entitled "The Support of Health and Personal Social Service Research". The report was made by the Chief Scientist's Advisory Group chaired by Professor A J Buller[3]. In some respects its terms of reference were similar to those of the House of Lords Sub-Committee on medical research. The Buller report certainly stressed the importance of Health Service Research to the NHS and recommended an increase in both quality and quantity of research output. But the results are not yet apparent. In 1985–86 a further enquiry into Health Service Research was carried out by Mr T E Nodder. This report was completed early in 1986 but has not been made public.

(a) *Determination of priorities* (Health Service Research)

Since DHSS provides the bulk of funds for Health Service Research it is clear that it has a major influence on the existing priorities. Applications for the funding of research can be made by any unit or in theory any research worker; but both the research capacity within Health Service Research units and the interests within the Research Liaison Groups or divisions of the DHSS determine the likelihood of the research funding so that the DHSS is, in this sense, in complete control of the research agenda. The determination of research issues may then be greatly handicapped by the "distance" of the DHSS from the NHS functions and problems. The research programme can be limited by differences of judgement and authority within the DHSS, the capacity of Research Liaison Groups or the Divisions to define adequately the research needs of the NHS (as distinct from DHSS) and the perspective, quality and intellectual range of the research workers. Preoccupations of the DHSS with particular aspects of policy have naturally often prevailed as the basis for project selection.

(b) *Balance of research resources*

We do not propose to address the funding of the Health Service Research relative to expenditure on Biomedical and Clinical research. In Table I we have set the DHSS expenditure on Health Service and Personal Social Service research between 1975–76 and 1984–85 and with it the net public expenditure on health services.

TABLE I

	1975–76	*1977–78*	*1979–80*	*1980–82*	*1984–85*
HS/PSS research (£millions)	5.486	7.021	9.111	13.842	11.147
Total net (£billions)	6.245	7.839	10.675	15.273	18.962

It can be observed that the research expenditure in this nine year period reached a peak of 0.09 per cent of NHS expenditure in 1977–78 and has declined steadily since then. This same period has seen two major reorganisations of the NHS, the Griffiths report and a major policy thrust concerned with the closure of long stay institutions with the attempted development of extensive community care facilities for the old, the mentally handicapped and the mentally ill. Given the scale of the problems facing the NHS, the need to innovate at many levels, and the urgent requirement for evaluative methods, this level of research expenditure we regard as inadequate.

There are other sources of funding for health service research. We have not quantified the total support for Health Service Research funding. The Buller report (1982) estimates (at 1980 prices) the value of the health and personal social service research support as

DHSS:	£12 million per annum
Research Councils:	approaching £2 million
Universities:	around £4 million per annum, mostly made up of salaries
Charities and Locally Organised Research:	probably less than £1 million per annum

[3]The Support of Health and Personal Social Services Research, DHSS (1982).

(c) *Need for changes in research priorities*

The flexibility of the Health Service Research programme and its capacity to respond to new needs is clearly limited by the present funding system in two major ways:

(1) The awareness of new research needs and the acceptance of this need as a basis for research priorities is mainly dependent on Research Unit Research/Liaison Group relationship. We have already identified the problem of "distance" between the NHS institutions and the DHSS. The Buller report noted

> "It is important to appreciate, and respond to, the research needs of the Regional and Area Health Authorities (District Health Authorities after reorganisation) and of the local personal social services, all of whom work under the general policy directives of the Department. Their perceptions of regional and local priorities may differ from those of Departmental national policy makers. The Department's arrangements for HPSS research should have regard to the requirements not only of the DHSS, but also of these authorities."

We continue to emphasise this view.

(2) This constraint is compounded by the overall shortage of funds available for research. In a period of severe economic pressure on the NHS itself and given that the time scale of some existing research projects are measured in years, the present capacity to respond to new research needs is severely constrained.

(d) *Funding institutions, capacity to influence the research*

As we have already suggested, most Health Service Research is funded through the DHSS so that the Department does in fact determine the funding of the research agenda. The King's Fund and the Nuffield Provincial Hospital Trust however have had a significant influence in encouraging, developing and disseminating Health Service Research. They have not only provided funds but have been involved actively as organisers of seminars, conferences, debates and publications dealing with a number of important research areas.

Other funds are available through charitable bodies such as Rowntree, Leverhulme, Wolfson, Mencap, Mind or Age Concern for research involving specific care groups or areas of interest; while the Medical Research Council does have a budget, in theory, allocated to Health Service Research.

(e) *Dissemination of research*

Effective dissemination or implementation of Health Service Research results requires a high level of interaction between research worker, policy developers, planners and providers of health care. The Health Service Research Programme has not been particularly effective in changing the behaviour of those who should use such research. The potential interactions between these groups are set out in Figure 1. Failures in the application of Health Service Research may be in part due to inappropriate or limited dissemination of results; but the failures in understanding and use of funds are probably due much more to the way in which research is commissioned and the nature of the relationship between the research worker and the health service planner or provider. The present research mechanisms isolate the research worker from those who manage or provide the care, so that mutual exchange and influences cannot take place readily.

There is, paradoxically, a need for the Health Service Research worker to be closely involved with policy matters, planners or providers while at the same time independent of undesirable influences from such sources. It is our belief that locating and funding more of the research programme at NHS levels (but still using the Rothschild approach to commissioning at, say, Regional level), would increase the usefulness of the research. The definition of research needs themselves, could then assist the management development of senior and middle grade health authority officers and clinicians. It would also provide the research worker with a much clearer idea of what is required and of the problems of the implementation.

(f) *The duplication of research effort*

It is not obvious that some duplication of research effort is in fact undesirable. This arises because Health Service Research is, in many cases, concerned with a local context (DHA or RHA) so that the research findings have an important but limited application. In other situations, the complexity of a problem may require several studies to determine levels of, say, cost or benefit. Clearly some national register of research projects and their scale of application is essential to reduce unnecessary duplication.

(g) *Health Service Research as a source of improved health or health care*

This is clearly the direct objective of Health Service Research activities but the causal link between such research and any beneficial (or harmful) effects are extremely difficult to demonstrate. This occurs because the implementation of changes in health service practice, organisation, or administration which may follow are incremental rather than dramatic (as may be the case with some outcomes of clinical or biomedical research). In addition such changes are often complicated by professional, financial or political constraints.

Nevertheless, as we have suggested earlier, there is a significant problem in the dissemination and use of Health Service Research findings, which is in part, we believe, associated with the present approach to commissioning and to the inadequate level of research funding.

(h) *Training of Health Service Research workers*

Many of those carrying out Health Service Research are *not* medical graduates. Indeed, one of the major failures of the DHSS programme of Health Service Research is evidenced by the inability to attract good quality medical graduates. Health Service Research is quintessentially a multi-disciplinary activity—drawing upon expertise in epidemiology, statistics, economics and other social and behavioural sciences. Training in Health Service Research must be seen as primarily a postgraduate activity within an existing research unit environment. Thus the issue of recruitment and training is related to the nature of Health Service Research as a career.

This problem has been addressed in several reports and papers but in the main recommendations were concerned with improving recruitment. Training or career opportunities have been ignored. It will suffice to quote from the Buller report which stressed the need for both an increase in trainees and trained researchers

> "HPSS research requires postgraduate, and post-doctoral experience. For candidates of good quality, research studentships and fellowships should be available in order to provide an adequate number of trained independent researchers. Studentships and fellowships should be awarded to candidates to pursue research with, or under the supervision of, acknowledged experts in the best available environments."

Once again, virtually no action has taken place to implement these recommendations and the problems of training and staffing remain unsolved.

(i) *Recommended changes in organisation and funding*

In this section we will summarise and draw together the arguments which have appeared in the earlier sections of the submission.

In an organisation as important as the NHS, working in a highly complex technological, social, economic and political environment, a proper level of investment in research and development is essential. Indeed neglect of such investment might be construed as a dereliction of management responsibility.

The present needs, we believe, are

(I) To increase the overall level of funding by 30–50 per cent.

(II) To allocate some of this additional funding to support a proper, continuing, effective Regional research mechanism within the NHS.

(III) This mechanism should be based on the application of customer-contracting principles of the Rothschild report.

(IV) This allocation should include a component to allow for some research training function within the NHS.

In Appendix A we submit a more detailed approach to RHS research needs as we conceive them to be within the South East Thames Region.

April 1987

Appendix A

REPORT ON RESEARCH IN SOUTH EAST THAMES REGIONAL HEALTH AUTHORITY

CONTENTS

1. Foreword

The Region takes large and far-reaching decisions. These are based on the best knowledge available and often after exhaustive study of the subject in question. National guidance, professional advice and "customers" views are all taken into account. But, however experienced or learned, senior officers and members are still fallible. Circumstances and needs vary over time. New and expensive inventions are developed. There is a natural tendency to regard the new as an improvement on the old. There may be an even stronger inertia to resist change and to cling to obsolete practices.

A brief reflection on the size of the RHA's responsibilities—around a 14th of the nation's distribution of NHS funds to the English Regions—makes it difficult to understand any concept of public accountability that does not include the process of questioning which a proper service research programme will entail.

At very least the discipline of conscious thought about the proven merits of new ideas and the phasing of developments to allow time for thorough appraisal will be in the public interest. It will also assist the RHA when facing difficult and politically uncomfortable decisions by providing a reasoned background to the debate. Research and development is an area drawn to our attention by the management consultants who advised the RHA on our new structure. Research and development is an area which the Authority can ill afford to neglect.

2. Current Position

This document briefly reviews the present mechanisms for commissioning and funding research within South East Thames Regional Health Authority (SETRHA). The usual way in which this research arises is either for a "need to know" identified directly or indirectly by Regional staff or by requests from other persons making proposals for research funding of particular projects.

The main concern of this document is, however, the development of a research strategy focused directly on the Regional Health Authority's (RHA) own "need to know" with the aims and means to attain this end. Such a programme should automatically arise from the Regional Health Authority's responsibilities and programme of work. Some research of this type has been carried out in the past but the low level of financial support, limited contact between those requiring the research at Region and the research workers, the relative slowness of the commissioning process and inadequate communication of the research results have meant that the SETRHA research needs have not been effectively or adequately defined or met.

During the course of this inquiry, the Chairman of SETRHA, Sir Peter Baldwin, observed that the National Health Service (NHS) was geared to action but have not developed mechanisms for "thinking" about problems or their solutions. It was difficult to argue with this observation and in some sense this document attempts to address this. SETRHA manages a budget of about £1 billion and is responsible for the provision of a complex set of health care services and activities. This is within an equally complex social, geographic, technical and political environment, so some effective mechanisms for "thinking" or "enquiry" would seem vital.

During the course of this brief study, the Chairman of the RHA and a number of senior Regional officers were interviewed about their perceptions of the RHA's problems, particularly as these related to inadequate knowledge or information. Other officers were contacted but were unable, in the short time available, to organise an interview. The views expressed, where relevant, have been incorporated into the analysis.

It may be argued that time, effort and money spent on research and development reflect management's attitude to investment in the future in the same way as does spending on training. In a service which continually benefits from the progress made by clinical research, it is incumbent on us to study the service implications thoroughly and with rigour.

2.1 *Locally Organised Research Scheme (LORS)*

The last major national review of locally organised research was undertaken by a joint DHSS/MRC working party which reported in 1974. A principal recommendation was that a Code of Practice should be prepared jointly by DHSS/MRC to incorporate detailed recommendations on the operation of the scheme. A Code of Practice was published in May 1975 in HSC(IS)148.

The Regional Research Committee was then set up to administer the funds distributed by the Secretary of State in accordance with these recommendations.

The Secretary of State retained direct funding of research in teaching hospitals until 1978 when Health Circular (78)10 instructed Regions to act as his agents in supporting this work.

This Region gives the Research Committee the DHSS allocation which they divide into the teaching hospitals quota and the sum to be used under the LORS scheme.

The teaching hospitals supplement the grant from the Region by the addition of Trustee funds. This supplement differs in size among the different hospitals, but has changed little with time. The hospitals are expected to submit to Region a list of names of the project leaders with the project titles each year, and the final report on completion of the research programme.

The funds dispersed under LORS are available to anyone employed in the NHS in the Region. The criterion for support has been based on scientific quality and not on professional interest or geographic location.

2.2 *Health Service Research and Development Committee (HSRDC)*

The Regional Health Service Research and Development Committee was established in 1980 to ensure that appropriate health services research would be carried out in relation to the Region's need. It is entirely concerned with Regional work and no central government funding has to date been provided.

Essentially, HSRDC should commission studies in support of Regional planning activities and may also consider relevant individual applications received direct or referred to it by the Regional Research Committee.

A summary of health service research projects to date can be found in Appendix A. It is notable that the projects supported over the past five years have largely arisen as a result of the prospective researcher's interests—not from an appraisal of the RHA's needs. There is some relationship with the Authority's own priorities, but no obvious mechanism for using the results of these studies to modify health service provision and practice.

2.3 *Present sources and mechanisms for funding*

2.3.1 Locally Organised Research Scheme

Financial provision for locally organised research is made within the overall DHSS revenue allocation to RHA and is no longer separately identified. A measure of protection is provided, however, in that expenditure on research is required to be reported annually and HC(78)10 encouraged RHAs to maintain historic funding levels. Even so, the allocation of funds is an RHA prerogative.

It is the present policy of the Regional Research Committee to confine grants to applicants from non-teaching districts. The financial allocation by Region en bloc to teaching Districts is 40 per cent of total locally organised research funds.

Historically the Locally Organised Research Scheme budget appears to have been regarded as a rolling budget provided that actual expenditure each year was contained within the revenue expenditure limit. The carry over of unexpended funds, however, is not permitted. In theory, grant holders are required to recharge RHA with their expenditure quarterly in arrears. The time lag between the allocation of grant provision and the presentation of charges from the receiving DHA is now being closely monitored with a view to bringing expenditure and revenue into line in order to allocate resources with greater accuracy.

2.3.2 Health Service Research and Development Committee

When this committee was instituted in 1980 it was given an annual budget of £20,000 together with £20,000 non-recurring available for only the first three years. Since then, the allocation has been limited to the £20,000 recurring and any additional monies required have had to be sought on an individual basis.

Due to this historically low level of funding, the Committee has tried to find alternative sources. When the proposed study has a national as well as a regional interest, attempts have been made to obtain help from organisations such as the Medical Research Council, Economic and Social Research Council or the DHSS.

In particular topic areas funds are sometimes available for relevant studies, and support has come from the Cancer Research Campaign and the British Heart Foundation. Approaches have also been made to MIND and MENCAP as well as the Asthma Research Council. There are many more of these bodies which are considered in relation to particular proposals.

If attempts to obtain funding from such sources are inappropriate or fail, other possibilities exist inside the RHA itself. Endowment funds have on occasion been used and one study is supported from the regional mental handicap budget. Approaches have also been made for use of the mental illness budget.

Support in this way requires strong regional interest and, in particular, agreement with the budget holder that research with the particular objectives is a necessary activity.

A third field is concerned with development. Success means that further work is required for laboratory usage or commercial exploitation. This can be done through the Regional Scientific Officer's equipment budget or by courting a commercial company to develop it, but in practice neither of these options is

commonly taken up and the work tends to go by default. This is an area which is not large but no policy has been agreed for its coverage.

2.3.3 Nursing research funding in SETRHA

Nurses seeking research funding have access to the same sources already outlined, as have all NHS employees in the Region.

There are now, however, a number of national research funding resources specifically for nurses with at least 20 nursing undergraduate and post-graduate programmes in Universities and Polytechnics in the United Kingdom. In SETRHA a short-term studentship scheme was set up in 1980 in association with the University of Kent for nurses working with the elderly. This was designed to engage nurses in an active learning process of orientation to baseline research education. The scheme is financed jointly by SETRHA Endowments Funds and the nurses' employing authorities. The nurses are seconded on full salaries with the RHA paying university fees and travelling expenses. No formal courses are established but students are allocated individual supervisors. The students are selected on their presentation of work related innovative ideas or feasible problems for investigation. A similar scheme has been established in collaboration with the South Bank Polytechnic for nurses working in SETRHA special assessment and supervision service units.

It has been found that these schemes seem to contribute to promoting nurses' awareness of research and motivation to improve standards of care. In addition the identification of nursing problems across District Health Authorities can create recognition of regional research needs in the provision of services for the elderly and mentally ill. Through the schemes some nurses are beginning to develop proposals to acquire further funding from regional LORS and HSRDC sources which are relatively untapped by non-medical staff.

3. Aims of a Research Strategy for the Regional Health Authority

3.1 *Terms of reference for the strategy*

As explained in the introduction the strategy outlined in this document is concerned primarily with the Regional Health Authority's "need to know". This could be envisaged as arising out of its responsibility and work programme. In addition some of the research programme could arise indirectly out of a District Health Authority's research needs when these are seen as relevant to the RHA's task.

Research as identified in this document is a broad concept and will vary from commissioned technical or clinical reviews of the state of knowledge, or of health service provision, to the development of alternative methods of collecting or analysing data from field studies.

This specification calls into question much of the present mechanism for the allocation of research funds.

Because the Locally Organised Research Scheme is a continuing statutory responsibility it is excluded from the present analysis. The role and function of the Health Service Research and Development Committee may require modification or replacement.

3.2 *Origin of research ideas*

It is anticipated that any Regional Health Authority research funding response could occur by requests from:

(i) In-house Regional Health Authority members or officers

(ii) Appropriate staff at District level

(iii) Referred proposals arising outside the Regional Health Authority from:

(a) University based or other bona fide research workers

(b) Existing research committees HSRDC & LORS

It is believed that requests from (i) and (ii) should predominate in this new formulation. This will require new money.

4. Objectives of a Research Strategy

This report assumes that the Regional Health Authority's need for research will arise out of its specific responsibilities and work programme. This can be categorised as follows:

4.1 *Policy, planning and implementation of both clinical and non-clinical services or activities*

SETRHA has a major role in formulating the broad goals of clinical services, the development of hospitals and the deployment of major capital resources concerned with meeting service needs.

At the present time, there are a number of major new hospital development projects, such as a realignment of radiotherapy and neurosciences, and new service developments in mental illness and mental handicap care.

In addition the planning teams are heavily involved in assisting the District Health Authorities in the implementation of their strategic plans within the budgets available.

The Regional Health Authority also has a major role in overall manpower planning, so the need for some research strategy to assist these undertakings is clear.

Research could be focused on:

(i) the development of a coherent prescriptive policy for service development;

(ii) enhancing the capacity to anticipate changes in the need for clinical and non-clinical services or methods of service delivery;

(iii) the determination of realistic and appropriate manpower, equipment or plant resource needs;

(iv) new ways of combining various resources;

(v) technical aids to decision making—for example—improvements in option appraisal by the use of quality adjusted life years (QUALY'S).

4.2 *Resource allocation*

The Regional Health Authority allocates financial resources both generally and specifically (medical manpower, equipment, large capital developments and the research programme should therefore be directed at improving this process. This would include developing:

(i) Socially equitable and sensitive methods of allocating revenue, manpower and capital to comply with the priorities given by regional policy and strategy.

(ii) Monitoring of implementation of the programme and the expenditure associated with this.

(iii) Methods of defining and measuring the outcome of such investment decisions.

4.3 *Service evaluation and monitoring*

The Regional Health Authority has a responsibility to monitor and advise about clinical and other activities at the District level. This requires a capacity not only to improve process monitoring but also to provide guidance about "territorial" service needs.

There is also a need to begin to develop a means of outcome assessment. A research programme would then assist in:

(i) Surveillance of unmet need relevant to national and regional policy.

(ii) Derivation of measures of service efficiency (target, technical and market). See appendix B, page 24 for more details.

(iii) Evaluation of quality of service provision and outcome, for example, new community based services for people with either mental illness or mental handicap. This activity needs to be coordinated with quality assurance programmes which are being developed to assess standards of services provided in the region.

4.4 *Training*

At the present time the RHA has a responsibility to supervise and monitor the coordination of occupational training for a wide range of nursing, paramedical and ancillary staff. The strategy being adopted stresses the facilitatory aspects of Regional Health Authority involvement in most areas and the role of training officers is increasingly being seen as that of consultant or adviser. A particular training responsibility has occurred as a result of the most recent re-organisation of the Regional Health Authority with attempts being made to change the management culture.

Research needs will then arise because there is a clear need to evaluate the achievement, effectiveness and outcome of existing training institutions and to define and specify new aspects of training needs.

4.5 *Other requirements*

There are other functions which could benefit from a research input and these can be identified by an appropriate research commissioning process.

Illustrative examples of the RHA's research needs are attached as Appendix B.

5. Review of methods for conducting Regional Research

5.1 *Commissioning of research*

The most important managerial step in this approach to research is defined as a method of commissioning research which will effectively identify research needs and allow the results of research to be used to its fullest capacity. One approach is the creation of a Regional Commissioning Panel, perhaps chaired by an appropriate member of the RHA (Chairman or the Director of Planning who is responsible for the research in the current organisation) and which contained an officer from each directorate senior enough to make decisions.

Attached to this panel would be a scientist with the knowledge of Regional Health Authority tasks and with an active background in health service research. This person's role would be to facilitate the identification of problems amenable to some research approach and to assist with the translation of a Regional Health Authority problem into specific research issues and questions. Asking the right questions is itself a skill and one which is essential to the effectiveness of the research strategy.

This panel would hold and administer the research budget by using defined mechanisms for the commissioning of research and ultimately it would receive the research report.

It would review the research programme on a regular basis and evaluate the usefulness undertaken to the service of research undertaken.

5.2 *Conducting of Research*

There are a number of possible models for a regional research *mechanism*. Broadly speaking there are four options:

5.2.1 To continue the present arrangements as outlined. In addition there would be, as now, research commissioned occasionally from within a particular directorate and paid for through the existing budgets or by access to special funds.

5.2.2 To develop within the Regional Health Authority a research unit where basic staff and infrastructure costs would be met from a dedicated budget, and additional fundings related to specific projects if needed. This unit could be located within SETRHA at Bexhill or in an existing medical school or university facility.

5.2.3 To provide support to one or several academic research units within existing medical school departments of community medicine, the Health Service Research Unit at the University of Kent or at the University of Sussex. This support would be a supplement to existing university commitments and other outside sources of funds (DHSS for example). Such support could take the form of nominated Health Service Research posts, perhaps targeted on specific skills such as statistics, health economics, epidemiology, management services, or even accounting. The posts would carry some cost component for maintenance and could be fixed appointments carrying some academic title.

5.2.4 To use the commissioning mechanism outlined, and to contract out specific research projects whose aims have been formulated by the commissioning panel. The process is outlined in figure 1.

Individuals or units invited to tender need not necessarily be within South East Thames Region. Part of the role of the scientist attached to the commissioning panel is to identify appropriate research workers.

The four model mechanisms should not be seen as necessarily exclusive and the optimal strategy may be some combination of these different approaches.

One way of determining this is to apply an option appraisal to these models after identifying the desirable characteristics of a research mechanism.

5.3 *Desirable feature of a regional research mechanism*

A list of desired characteristics may be given:

(i) An ability to formulate the research questions related to RHA plans and problems.

(ii) An ability to react to differing situations requiring a variety of techniques and skills.

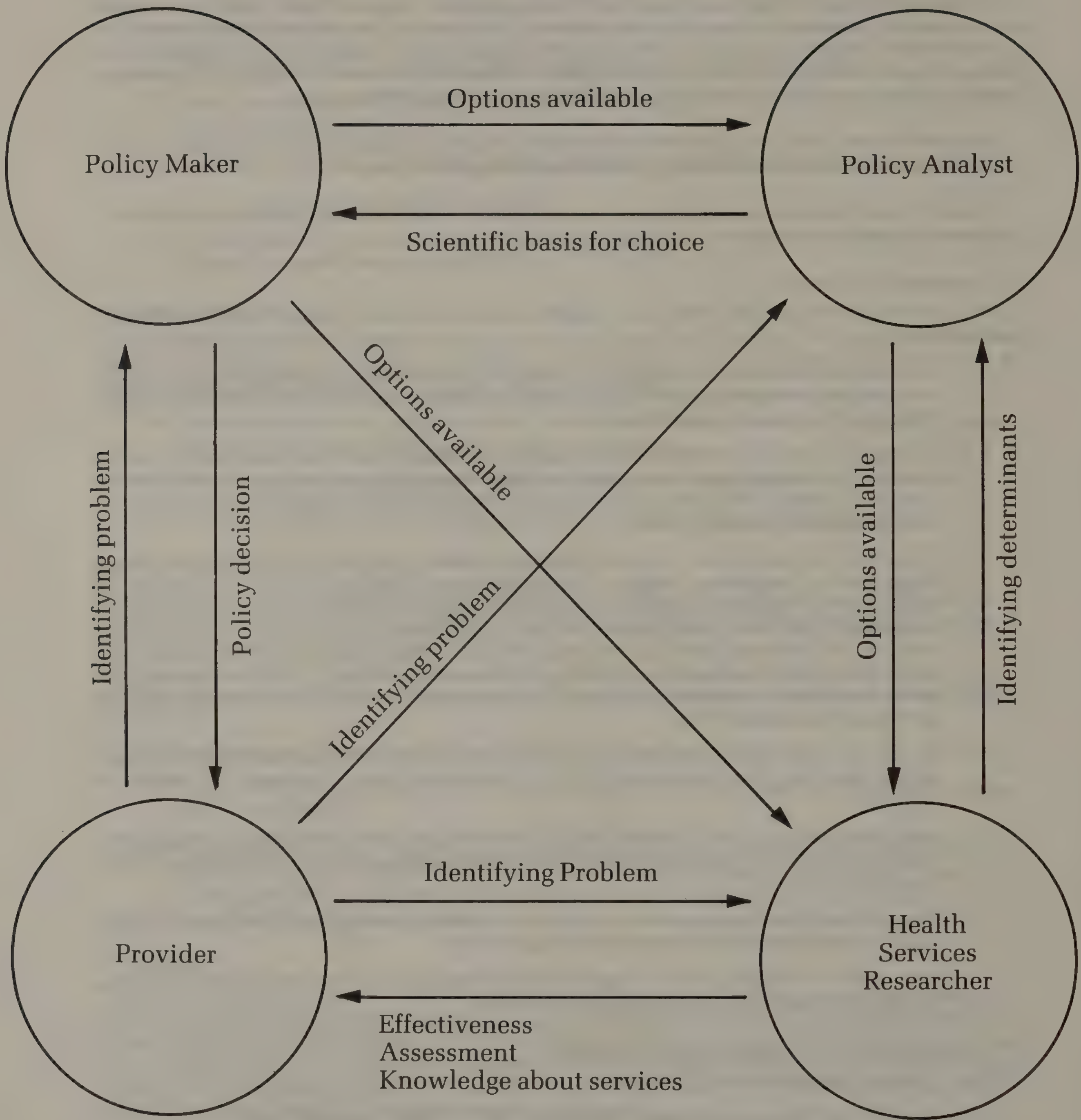
(iii) A capacity for tight research programme management.

(iv) A capacity to evaluate the outcome of the research programme.

(v) Knowledge of, and contact with, a wide, diverse research network.

(vi) A potential for feedback and translation of research results to those posing the initiating problem.

FIG 1. **INTERACTIONS BETWEEN RESEARCH AND HEALTH SERVICE ADMINISTRATION**



(vii) A capacity to resist research contractors' intervention during the research enquiry itself.

(viii) A potential to provide management skill development to the Regional Health Authority and its officers.

Weightings could be assigned to these characteristics, and then each model could be examined for its potential benefits. Provisionally one could expect model 4 (regional commissioning panel with project selection and funding) to score well with characteristics (i), (vi) and (viii) while model 3 could give weight to characteristics (ii), (v) and (vii).

It would seem likely therefore, that an optimal strategy could be to use model 4 both as an overall supervising mechanism and as a means of some project funding but some resources should also be committed to specific research posts within existing research units in the Region.

At the present time for example, there is a clear need for an economist with health economics background and expertise in epidemiological analysis and interpretation. The Health Service Research Unit (HSRU) at the University of Kent could be an appropriate location for an economist because there is already a concentration of economists and welfare economists within the Faculty of Social Sciences and the Personal Social Service Research Unit (PSSRU).

It is equally obvious that the HSRU within the Department of Community Medicine at St Thomas' Hospital campus of the United Medical School could be an appropriate location for an epidemiologist.

These research workers could have as their first responsibility the Regional Health Authority's "need to know"; indeed their job description could be that of a Regional employee outposted but within the Policy Development and Research Division. Such posts could be on a five year contract and the funding could include some support costs.

A useful example can be found at the HSRU, University of Kent, where the appointment of a senior research fellow whose salary and infra-structure costs were paid for by Medway Health Authority, has resulted in the attraction of considerable outside funds.

6. How much should we spend on research?

In this document we are primarily concerned with examining an explicit and specific RHA research funding process to enable the commissioning of research in-house to meet the RHA's "need to know" and which would entail the allocation of new money.

Any such mechanism does not preclude access to other funds described above. These funds should be seen as supplements to some defined, guaranteed RHA budgetary allocation for its own research needs.

Clearly, recommendations about funding will in part be determined by the nature of the research commissioning process which is chosen. This uncertainty, however, can be ignored and the level of funding can be argued on other grounds.

One appropriate model can be found in the DHSS.

> In 1983–84 approximately £15.5 million of commissioned research was committed to the National Health Service by the DHSS. This expenditure was defined within six categories—research units and groups; single projects; development, medical equipment, appliances and supplies; computer research and development; building and engineering research. The research funding within the first three categories amounted to about £10.5 million. The total investment represented about 0.1 per cent of the overall NHS expenditure or about 16 per cent of the total central administrative costs.

If these ratios were applied pro rata to the SETRHA budget the research allocation suggested would be between £1 million and £6 million annually. Clearly such a sum would not only be impossible to raise or perhaps justify but it would be questionable whether it could be spent effectively or prudently during the next five years. Since the funding allocation is concerned with research to assist the RHA in its responsibilities and programme of work, it would seem appropriate to view the need for a research budget as it relates to the administrative cost of the RHA itself. (£37.2 million for the year ended 31 January 1985.)

To commit about 1 per cent of this allocation to research and development would seem a modest target and could, if effectively used, not only create its own reserve savings but enhance the administration and management performance of the RHA as a whole.

By way of comparison, the Organisation of Economic Cooperation and Development (OECD) has recently published international comparisons of national expenditure on research and development (see

Table 1). By these standards, varying from 2.15 per cent to 2.72 per cent of gross domestic product, the commitment of 1 per cent of the RHA's own administrative costs must be seen as a very small beginning.

TABLE 1

Expenditure on Research & Development, 1983

(Units: US$ millions)

	Gross expenditure on R&D	*Gross expenditure as % of GDP*
United Kingdom	13,499	2.28
France	14,252	2.15
West Germany	19,473	2.54
Japan	34,371	2.56
USA	88,976	2.72

Source: OECD
Note: GDP = gross domestic product

It would be judicious to recognise that the development of a research strategy will take time, that skills will be needed and that it is an exercise which may act as an important form of senior RHA staff and Member development.

One could envisage an initial research allowance for year one of about £100,000 split between the latter two of the four research strategies outlined in 5.2. This would then be increased annually to reach a target figure of about 1 per cent of RHA administration costs (approximate £300,000) by the end of the fifth year. (See Table 2.)

This build up should allow the RHA to appraise the development as it proceeds and to allow some flexibility in the relative weighting of the two approaches.

The budget holder and financial administrator should ideally be within the Directorate of Planning, possibly within the Policy Development and Research Division.

Under these arrangements the build up of inputs might be represented schematically as shown:

TABLE 2

	Project funding (in £000's)	*Specific nominated posts (in £000's)*
Year 1	100	40
Year 2	150	80
Year 3	200	120
Year 4	250	160
Year 5	300	200

7. Recommendations

7.1 *Commissioning research*

7.1.1 SETRHA should set up an in house commissioning panel to define on going research needs appropriate to the RHA's responsibility and programme of work.

7.1.2 This panel should consist of senior officers representing all major directorates and should be chaired by the Regional General Manager of the Chairman of the RHA.

7.1.3 The panel would also benefit greatly from the attachment of liaison scientist who would assist the panel, identify and formulate its research needs. In many ways this approach represents that suggested by Rothschild.

7.1.4 The responsibility for the management of a defined research programme should be within the directorate of planning.

7.2 *Conducting research*

It is anticipated that two mechanisms for conducting research should be used.

7.2.1 Some research could be in the form of defined projects put out to tender amongst appropriate individuals or units in the academic or research communities.

7.2.2 Some research could be conducted within existing regional research units by the appointment of researchers of appropriate disciplines. Even at this point it is clear that epidemiology and health economics are two skills for which the region has a continuing need. Such posts should be for fixed term contracts and should be RHA jobs outposted to relevant units.

7.3 *Budget*

An initial budget of £100,000 would be allocated and split between the two mechanisms outlined in Table 2. This sum would rise incrementally to reach £300,000 per year at the end of year five. For future years this sum would be set at approximately 1 per cent of RHA expenditures.

Given the scale of the problems facing the RHA, these recommendations, if accepted, should be implemented within 12 months

Appendix A

A PROJECT FUNDED THROUGH THE HEALTH SERVICE RESEARCH AND DEVELOPMENT COMMITTEE

A.1 Completed Projects

A.1.1 *HSR81/01—Mair/Pahl/Campbell*

"Evaluation of services for severely mentally handicapped children in the Medway District".

This was commissioned by the Medway Health District and completed in June 1984.

The total cost over three years was £42,000.

The funding came from the Health Service Research and Development budget.

A.1.2 *HSR81/02—Hunt/Proctor*

"The development of a method of incorporating into the nursing services manpower planning system the effect on the provision of nursing produced by the dual status of nurse learners as trainees and employees".

This was commissioned by the Regional Nursing Officer and taken to HSRDC by Miss Hunt. It started on 1 January 1982 for the duration of three years.

The total cost was £38,546.

The funding came from the Health Service Research and Development budget.

A.1.3 *HSR/03 – Dr D Perkins*

"Medical advisory machinery in the National Health Service".

A proposal was submitted by Dr Perkins in association with Professor Warren and HSRDC agreed to fund part of it if the King's Fund would contribute the rest.

The project began on 1 October 1981 and finished on 30 September 1984.

The Health Service Research and Development Committee contributed £13,642 over the three years and the King's Fund contributed £7,500 over the three years.

A.1.4 *HSR81/04—Chailey Heritage (Mr P Badham)*

The purpose of this project was to identify the long term role of Chailey Heritage.

This was commissioned by the Regional Health Authority and a Steering Group was set up to produce a protocol for research needs at Chailey. The final report in five parts was basically a description of the activities at Chailey.

The project commenced in July 1982 and finished in September 1985.

The total cost was £44,431 paid for out of the Health Service Research and Development funds.

A.1.5 *HSR85/01—Spratley*

"Measuring the impact made by specialist alcoholism services on the usage of General Practitioners by alcoholics".

The application was submitted by Dr Spratley originally to the Regional Research Committee which then referred it to the Health Service Research and Development Committee.

He was authorised to begin in November 1985 for a duration of three months.

The Health Service Research and Development Committee contributed £6,750 and the balance of £2,250 was found by Dr Spratley.

A.2 Current Projects

A.2.1 *HSR85/02—Hildick-Smith*

"The effect of opening 25 beds in the District General Hospital on a geriatric service".

Dr Hildick-Smith sent in an application for the above which was approved in November 1985 for a duration of one year. She has since been granted an extension of an additional year.

The total original grant was £1,300 and an extra £867 was granted for the additional year.

A.2.2 *HSR85/03—Bobrow*

"Evaluation of first trimester pre natal diagnosis".

This project arose because the DHSS saw the need for a comparison of the safety and cost benefit of chorion biopsy in relation to amniocentesis. As a result of this view the Medical Research Council was approached, and agreed that such an evaluation was necessary and undertook to cover those costs related to the research administration aspects. No plan was made to support the service costs.

Professor Bobrow put in an application concerned with assessing the safety and efficiency of chorion villus sampling in the first trimester for diagnosis of foetal abnormalities, to evaluate different strategies for rapid specimen processing in providing a Regional Service and to look at the operational problems related to the delivery of such a service in the South East Thames Region.

This was approved by the Regional Management Team and started in February 1986. It is funded from Regional Endowment Funds at a total cost of £32,029.

A.2.3 *HSR85/04—Mansell*

"Severe mental handicap and problem behaviour, evaluation of transfer to community care".

Mr Mansell put an application to Health Service Research and Development Committee and it was approved in late 1985.

This commenced in early 1986 and funding was found from the Mental Handicap Budget at a cost of £64,000.

A.2.4 *HSR86/01—Allsop*

"Pre school developmental screening—parental attitudes and update among ACORN groups and evaluation of outcome in children referred".

This began on 1 May 1986 with a duration of three years.

The total amount granted was £23,601.

A.2.5 *Evaluation of special assessment and supervision service units (SASS) in South East Thames Region*

A Steering Group was set up in April 1986 by the Region on behalf of the DHSS to describe and evaluate the SASS service during a period of up to two years.

The funding from the DHSS for setting up the units included money for the evaluation.

The Regional contribution was £34,600.

A.3 Current Proposals

A.3.1 *Dr J McEwen*

"The relationship between various measures of need and social deprivation with specific reference to ACORN".

The protocol was prepared by Dr McEwen and is supported by the Health Service Research and Development Committee at a cost of £32,108.

It has been referred to the Regional Management Team for consideration of the money being provided from Endowment Funds.

A.3.2 Several proposals have been submitted on the follow up of mentally ill patients as they are released from psychiatric hospitals into the community.

The final proposal is still being studied and must answer those questions put forward by the planning department. (Financial support must come from outside of HSRDC as the budget could total up to £200,000.)

Appendix B

B CURRENT RESEARCH NEEDS

SOME AREAS OF ENQUIRY CURRENTLY RELATED TO THE REGIONAL HEALTH AUTHORITY'S "NEED TO KNOW"

At the present time the RHA distributes or spends approximately £1 billion per year. The purpose of this expenditure is the financing of existing services or the development of new services.

A number of major problem areas are already apparent where difficulties arise from inadequacies of information or methods of allocation or assessment.

Examples are not difficult to find.

B.1 *Mental illness services*

Both the Regional Health Authority and the District Health Authorities are presently committed to a programme of long stay hospital closures and a development programme of community-based mental illness services. There is no programme at present aimed at developing and testing service innovations or at evaluating the outcomes of different models of care or service. Although there are some efforts being made to catalogue and assess nationally the benefits or costs of various individual schemes, large areas of uncertainty remain in organisational outcome and cost terms about what is achievable. There is a shortage of data relating to the epidemiology of mental illness, its social impact, the outcome of treatment, and the utilisation of medical or social welfare services by persons identified as mentally ill (except the numbers of those using hospital admission and care).

In the absence of any stable service arrangements, it is difficult at present to develop additional useful methods of costing, but sooner or later this will become necessary. It is difficult to see how the RHA can provide effective resource allocation, planning or monitoring without some investment into research aimed at clarifying these uncertainties.

B.2 *Elderly care services*

Many of the same problems outlined above exist in relation to these services. There are, however, two major areas of uncertainty which could be the focus of RHA activities—efficiency and "territorial needs" indicators.

B.2.1 Efficiency

There are three types of service efficiency which can be used in the scrutiny of District activities, both for this priority care group and for other groups.

(a) Target efficiency

Here the object is to examine whether those receiving services meet defined criteria of need (vertical target efficiency) and to what degree there is a pool of people not receiving services when they fulfil "needs" criteria (horizontal target efficiency). This approach could be applied, for example, to look at the provision of cataract surgery, hip surgery or intensive domiciliary care services.

(b) Technical efficiency

In this measure of efficiency the study would be on the relationship between input and output for some given intended social or clinical goal. For example, the technical efficiency could be measured as respite care versus intensive domiciliary support if one accepts the need to provide support or assistance for the family or informal carers of the infirm elderly. As a simpler example, this sort of enquiry might be useful in deciding on the advisability of the use of day surgery for a number of particular procedures

(c) Market efficiency

Here the relationship could be examined between specific service provision and the client or patient desire for this or some alternative service.

Although much of the official literature about the care of the elderly stresses the need to comply with individuals' wishes, there is almost no strategy to identify these wishes. For example, it may be relevant to discover to what degree people would prefer to make their own arrangements for certain types of care, and to support this financially rather than by direct service provision.

Although "consumer satisfaction" is regarded as an increasingly important aspect of management achievement, the shortage of any valid, realistic or useful method for achieving this remains a serious handicap.

B.2.2 Territorial needs indicators

At present, all Health Authority planning proceeds from "demand" data, that is the expressed demand for services becomes synonymous with normative need. In the programme of resource allocation this may be modified by the use of standard mortality rates (SMR) to act as a proxy for social deprivation. In certain types of service provision, this approach does not appear to be very sensitive or relevant. Thus, in resource allocation for mental illness services, SMRs are probably poor proxies for a service with social goals which only marginally recognises the prevention of death as a goal. In the case of elderly care services, death is to some degree a common outcome, and here the different SMRs for social classes tend to converge.

A more appropriate basis for resource allocation should be some territorial needs indicator which reflects the imputed needs within particular social or clinical goals. The development of such an approach for other major care groups will provide base line estimates for measures of efficiency, for service monitoring and evaluation and methods for developing more equitable techniques for resource allocation.

B.3 *Acute services*

The current planning of acute hospital services such as the programme of DGH development or acute service planning at District level requires better methods of service description or analysis. This is because there is a tendency to treat acute services collectively and ignore case mix differences within services in a way which retains the history of such developments. This prevents the planner acknowledging the changes likely to be conditional on other technological and service developments in the foreseeable future.

There are almost no studies of service evaluation even where, as is the case with radiotherapy and neurosciences, large capital and revenue expenses are planned. Thus, in the case of radiotherapy, there is a need to evaluate its role and its future, both therapeutically and technologically, and to decide about methods of evaluation, particularly those related to palliation.

B.4 *Manpower issues*

The RHA directly or indirectly through the Districts has a large number of staff of different classes and grades and within complex structures of conditions of pay. Although many of these are determined by national agreements, there is clearly room for manoeuvre and there are very important unanswered questions about the needs for and standards of work, training or appraisal.

There are no useful measures of productivity—particularly in the clinical services. Given the importance of such staff and radical proposals to alter staff grade mixes, this must be accounted a serious defect. These are difficult areas to address and a programme of evaluation, enquiry and research seems essential to achieve significant service enhancements or innovations. This is not likely to occur unless the RHA pursues these matters deliberately and systematically as policy.

B.5 *Capital allocation programme*

At present the RHA is under considerable pressure to replace and upgrade diagnostic equipment. This clearly has both resource and service implications. At least three areas of enquiry which will relate to RHA decisions can be identified.

B.5.1 Logistic appraisal

In 1983 the O & M division carried out a study of the utilisation of existing X-ray plant in four Districts. This study revealed that significant cost savings could be made in terms of both staff and replacement of equipment. The study also raised the possibility of new guidelines and work practices as well as purely clinical matters relating to the requests for investigation.

B.5.2 Technological appraisal

There is a constant pressure of demand for new types of capital equipment, both diagnostic and therapeutic. There could be both technical and political advantage if some research activity or independent technical appraisal could be undertaken, ideally in advance of the pressure of clinical requests.

B.5.3 Priority assessment

Given that demand for certain types of equipment (for example CT scanners) is far greater than the resources available to meet these demands, there is a need to develop better systems of

determining priorities for such an allocation. These criteria need to be rational, explicit and widely understood. A modest programme of research or enquiry would assist this process.

B.6 *Development of methods for cost and effectiveness modelling*

At the present time there is considerable demand from the DHSS and elsewhere to develop new programmes of surveillance or service provision and to modify or rationalise old methods. This demand has arisen in proposals for AIDS, cervical screening, breast cancer screening and within the multi district specialties. Most of the consultation documents or planning instruments contain no estimates of cost or effectiveness.

A good example can be found in the current consultation by SETRHA on Breast Cancer Screening. This document produced by the Region's Cancer Coordinating Committee would be far more effective in both technical and political terms if it had contained cost effectiveness estimates obtained by theoretical modelling to estimate the costs of achieving woman-years of additional life saved. This model could draw on a review of existing cost, logistic and clinical data to derive "optimistic" and "pessimistic" estimates for a variety of service options. It would represent a considerable extension and improvement of present option appraisal methods used by SETRHA.

The six areas of research and enquiry suggested above *are far from exhaustive*. Many other minor or major research studies would contribute to the effectiveness and efficiency of decision making and management within SETRHA.

Ideas for enquiry that have been suggested include:

Blood transfusion services
Acute renal services
Automated cervical screening
Obstetric services and neonatal care
Nursing activities and strategies
Effect of high building costs on the quality and quantity of provided facilities
The Brighton cardiac resuscitation programme

It is apparent from discussions with senior officers that the availability of an appropriate research mechanism would act to develop the capacity of the staff and the authority to question, improve decision making and to manage. In this case an appropriate research mechanism would also act as an important form of staff development.

Letter from the South West Thames Regional Health Authority

With reference to your letter of 3 March, I list below answers to specific questions:

(a) *How are the priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

The priorities are set largely by clinical practitioners. They reflect more the particular needs of the diagnostic, technological, and therapeutic advance rather than health needs.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

There is insufficient research into the underlying determinants of health. Whilst it is essential that we continue to research secondary treatment, basic research into both pathology and epidemiology should have priority. In terms of national health need, epidemiology should maintain a high profile, and it would be useful to explore positive discrimination in protecting areas of fundamental research which run the risk of slipping down priority lists.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

In my view, there is not a great deal of evidence that priorities in medical research are adapting to changes in incidence of disease, changing population structures and new technology. For instance, the impact of an increasing number of people living to be very old, and the changing patterns of disease among them, appears to have low priority. There appears to be a considerable gap between the philosophy underlying performance indicators, and the factors which relate to the outcome of medical intervention. It appears that priorities of medical research only change under considerable pressure.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

Institutions funding research do have significant influence over the direction of that research. Commercial and charitable organisations very often have clear goals which they wish researchers to pursue. Such goals often have little to do with fundamental research which is more likely to be directed towards primary research. Significant proportion of research funds should come from public monies in order to ensure the continuance of broad based pure research.

(e) *Are the results of research adequately disseminated?*

Usually dissemination is adequate unless the research is based on specific contract.

(f) *How is unnecessary duplication of research effort avoided?*

Duplication could be reduced. It is important to test hypotheses in different settings, and this can give rise to duplication. More up to date outline directories should help researchers to avoid this pitfall.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

Research is reflected in improvements in patient care, but these improvements tend to be patchy. The effects of research findings tend to be superadded to existing practice. The profession is necessarily very conservative, since everybody is wary of "Hawthorne" effect, and the impact of medical intervention can only be assessed over long periods.

There is no current review for clinical care. It is largely left to the individual clinician to report on clinical outcome, and the establishment of review process supported by formal medical bodies such as Colleges and Faculties could further the development of such a process.

(h) *What changes in priorities in the training of medical researchers are needed?*

At present there is a significant price to pay by doctors who undertake research, since it significantly affects career progression. Recognition of the value of some research training for all doctors, perhaps a six month period would raise the level of interest in research, and the capacity to understand it. Such a short programme for all doctors may help to identify those individuals who are capable of research, but they would need career opportunities.

Increasingly medical research is assisted by investigations in the fields of health economics, biochemistry, physics and other basic sciences.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

The Health Service Organisation should recognise that they have a commitment to research and not just for the resolution of immediate problems. There is a concept that research is something done outside the Health Service by universities or institutes, and this may inhibit the recognition of relevant problems and conceal real need. The identification of a specific budget percentage to be devoted to research and evaluation would be a step forward.

The new initiatives in the Health Service for the pursuit of quality emphasise the need for this to be done at a point where the public receives service.

This Authority finds itself under increasing pressure to fund research programmes, many of which could be very valuable. The timetables of much classic research tend to be very long, whilst Health Service problems are very immediate. A judicious mixture of short and long term research can be very helpful, in that short term research reminds research workers of the need to look for the solutions to pressing problems, and long term research maintains the kind of specific rigour which is vitally important. The involvement of research institutions in straightforward contracts to deliver research findings can also enhance Health Authorities appreciation of the value of research.

In this region we have a very active locally organised research programme, but there is a significant shortage of takers, since research skills are rare. Nonetheless, such a research programme does kindle interest, and gives individuals an opportunity to try their wings in the research field.

Antony Driver

April 1987

Additional Letter from the South West Thames Regional Health Authority

In this Authority we have had some experience of the use of both Management Consultants and University Departments to help us with medical research particularly Health Service Research.

St. Thomas' have recently completed two investigations for us in looking at our cardiac facilities and doing an option appraisal on the location of services for ophthalmic surgery. We are in the process of commissioning the Department of Community Medicine at St. George's to look at our requirement for psychologists and occupational therapists.

We have had some considerable experience with management consultants in helping us with Health Service Research. They recently completed a review in Neurosciences for us and we are awaiting the outcome of a review of our Cancer Services.

In the case of Neuroscience Research we were looking particularly to the rationalization of an existing service within constraints created by resolutions of the College of Physicians, custom and practice and demographic considerations. The management consultants were advised by two eminent consultants who were wholly objective since they came from well outside this Region, and they delivered their report to time in an acceptable form. The report however was absolutely derivative since neither the management consultants nor their advisers were in a position to apply the kind of inductive reasoning which we could expect from an academic department skilled in Health Service Research.

The major pressure of consultation was upon the advising medical consultants who were not experts in any sense in the field of option appraisal, logistics, resource usage or demography. In addition the report was extremely expensive.

The Cancer Service report is not satisfactory and has not been delivered on time. We are having serious difficulties in dealing with the management consultants involved, perhaps because of the complex nature of cancer problems.

In contrast the reports which St. Thomas' did for us on Cardiac Surgery and Ophthalmology were handled by individuals with broad based training in Health Service Research, immediate access to skilled medical advice and a deep understanding of Health Service function. Both reports were well presented, delivered on time, and vastly cheaper (of the order of 10 per cent of the cost) than the management consultants reports.

Whilst management consultants have certain advantages to offer in that they seem to be readily available and can recruit flexibly with an object in view, they appear to me to be very much a second best in the field of Health Service Research, and it is my intention in the future to advise my colleagues that whenever we are in need of some Health Service Research that we cannot cope with in house, that we should invite tenders from University Departments particularly from the Community Medicine departments of medical schools in addition to approaching management consultants.

David Wild
Director of Professional Services

July 1987

Additional Letter from the South West Thames Regional Health Authority

I am replying to your letter of 17 November 1987 addressed to Sir Antony Driver on the subject of medical research and the use of medical and management consultants.

The position in this region is that we use a wide range of management consultants on a broad range of assignments associated with health service activity but it would be rare that we would employ them specifically on clinical research or assignments associated directly with medical research. My reply therefore comprises a more general response on the use of management consultants and may only be of limited value to your committee.

In the year 1986–87 for contracts valued over £100,000 there were only two contracts and both of these were associated with major information system projects commissioned by the RHA. Contracts valued between £10,000 and £100,000 were more numerous and were spread between the RHA and the 13 districts in the region. Within this category there were 12 in the year 1986–87 and in the current year a further 16 assignments. Contracts valued below £10,000 tended to be more randomly commissioned by districts in particular and we have information on 10 in 1986–87 and 16 in 1987–88.

We regard detailed information relating to these assignments as commercially confidential between the sponsoring organisation and the firm of management consultants concerned and trust therefore that the information given above is sufficient for your purposes.

A J Kember MA AHSM

December 1987

Letter from the South Western Regional Health Authority

In response to your letter of 3 March 1987 I would like to endorse the following points which have been put forward by my Regional Medical Officer and Regional Scientific Officer.

Considerable work needs to be done on evaluating new technology quickly so that its proper status can be established before pressure builds up for voluntary funding by over-enthusiastic members of the public.

There is no fool-proof way of finding out whether we are duplicating work being done elsewhere or whether what we are supporting fits in with overall research priorities nationally.

Better coordination between the Chief Scientist's Department, DHSS, MRC and Regional Research Committees is needed so that the latter are aware of the programmes being supported at national level and that the former are aware of the proposals coming forward at Regional level and of the results of locally sponsored research.

If this were done, there might be less duplication of effort and more money available to push forward local initiatives faster as part of a national pattern of research into, say, the clinical uses of Magnetic Resonance as an example.

In this Region, work is going on on the use of Magnetic Resonance in early detection of changes due to malignancy, trying to confirm preliminary work done in America (at Bristol) and also on detecting early arthritic changes in synovial fluid in joints (at Exeter). There are also studies on the use of dye-lasers, hyperthermia and monoclonal antibodies on treatment of tumours.

With the advantage of the Burden Neurological Institute in the Region there is interest, too, in brain mapping techniques in, for example, epilepsy.

Other groups in Bristol are working on ultrasound to establish techniques for tissue characterisation, early detection of breast cancer and flow studies in arterial diseases.

If it would be helpful to you to receive additional information, I will be happy to assist.

Vernon Seccombe
Chairman

April 1987

Additional Letter from the South Western Regional Health Authority

I am replying to your letter of 17 November 1987 which requested information on the scale of expenditure on management consultants and commercially commissioned management information for Medical Research. We have asked all authorities in the region for this and have received nil responses from all of them. I trust this is of assistance to you.

Vernon Seccombe
Chairman

December 1987

Letter from the Spastics Society

I refer to your letter of 3 March. My response to the questions raised is as follows:

(a) The Society is concerned directly and specifically with cerebral palsy. Within this framework priorities for research are decided by expert advisory committees in consultation with the Executive Council. Advice is also sought from members of the Society and from the Society's staff.

(b) The Society's involvement in research is severely limited by financial constraints. Were the funds available the Society would support further work on: causes and prevention of cerebral palsy, the integration of disabled children, the use of new microelectronic technology by the disabled, the effects of disability on the family.

(c) General medical advances have led to an increased life expectancy for the disabled but little is known of the consequences and needs which this brings. The matter requires urgent attention which we are not able to give.

(d) As indicated the Society's funds for research are severely limited, little or no money is available from commercial sources because they do not see a return on investment. Funds from public sources have been substantially reduced in real terms and in consequence important projects (which previously might have been supported by MRC or DHSS) are referred to the Society but we are unable to support the great majority of them.

(e) The dissemination of the results of research is a difficult problem but it is a matter to which the Society has devoted attention and resources. The Society supports a Medical Education and Information Unit which arranges national and international meetings of doctors, biomedical scientists, health care workers etc. The society also supports one of the major international journals in the field (Developmental Medicine and Child Neurology) and other publications.

(f) The most effective way of avoiding unnecessary duplication in research efforts is by ensuring that information is widely disseminated between scientists in cognate fields in different countries and also between research workers and those involved in the care and education of our clients. We know of little evidence to suggest the unnecessary duplication of research in those areas that are of concern to the Society.

(g) We believe that there is room for substantial improvement in this direction. However, a significant limiting factor is the availability of suitably trained personnel.

(h) Many of the most significant problems with which the Society is concerned do not fall within the domain of a single scientific discipline. The training of medical and biomedical research workers, including those in the behavioural sciences, should reflect the essential interdisciplinary nature of the problems which require attention. The specialist training of research workers has fitted them well for particular purposes but has associated with it a real danger of "intellectual short-sightedness". Research requires intellectual flexibility and this should be a specific goal in the training of research workers.

(i) The lack of proper career structure for professional research workers in medicine, the biomedical sciences and the behavioural sciences relevant to the interests of the Society imposes a severe restriction on the best use of highly trained personnel. Some areas of research are more fashionable than others and as a consequence there is every likelihood that some problems, often problems of economic and social significance, are either overlooked or underfunded. In general disability has tended to be an unfashionable area. In relation to the importance of the issues we believe that it would be appropriate to shift more of the funds available for research into these areas.

Please let me know if I can be of any further assistance.

Sir John Cox
Director

April 1987

Letter from E R Squibb and Sons Limited

Thank you very much for your letter of 4 March. I apologise for the delay in replying and hope that my comments may still be considered by the Sub-Committee.

As the Medical Director of a United Kingdom company whose head office is in America, I have a local involvement with clinical research but, in addition, the total corporation has an interest in all sorts of medical research from basic research up through clinical research.

Our prime interests as a company relate to the cardiovascular, antibiotic and neuropharmacological fields and, as such, some major new therapeutic breakthroughs have come out of our research. Up until now most of the work has taken place in America but the reputation of British science at both a basic and clinical level means that money could be invested in the United Kingdom if the opportunities are right. However, if money were to be invested, this would be in competition with the US but also with other major countries, for example Japan, Italy, Germany or France which are all trying to attract research money from multinational corporations. At present it is not clear to us that the Government has a policy on encouraging investment in the United Kingdom from such corporations and, in some ways, through the prescriptions price regulation system there is no encouragement to invest.

To answer your specific questions:

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?*

This is an extremely complex question as basic science is likely to be advancing independently of the needs of the health of the country but many of those needs either in physiology or in pharmacology lead to the development of active compounds. In general, the basic work is being carried out in the universities and the development work is being carried out within the pharmaceutical industry although there is some crossover of the two. The drug industry is likely to invest in areas which it regards as having a high potential whereas basic scientists look at areas of scientific interest regardless of the resulting potential.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

There is some confusion in an analysis of the frequency of different diseases based on the fact that people are now living longer. If we all died at say 35 years then most of the major problems of cardiovascular and cancer mortality would be eliminated and, therefore, it is important to look at problems which are age related. The important priorities, presumably, are to address mortality and morbidity in the age range of 30–50 which would probably have a totally different incidence from the mortality and morbidity at an age range of 50–70. The problems of the over 70s would be different again. Too often confusion is generated by mixing death rate or morbidity without looking at its age relationship. In addition, you can only die once and, therefore, a reduction in heart disease is likely, for example, to lead to an increase in cancer as people live longer. It is, therefore, difficult to get the balance right without looking at integrated epidemiological data.

What is becoming increasingly important in pharmaceutical research is not only making people live longer but, perhaps more importantly, improving their quality of life whilst they are alive. Improvements in treatment in certain areas which heighten the quality of life and do not have the side effects of previous treatments are proving to be major advances and this is an important area which needs further research.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

It is likely that the early scientific training and the output of university departments leads to the balance of scientific interest in later years. If graduates are trained in synthetic chemistry, then they are unlikely to be able to switch to another field and, therefore, the universities in some ways through their training determine the subsequent priorities by availability of skilled personnel.

(d) *How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

As previously stated, international pharmaceutical companies can invest in any country in the world and, therefore, it is up to the Government to try to encourage major capital investment in the United Kingdom from multinational companies and indeed from British pharmaceutical companies. This should be in addition to the Medical Research Council and the University Grants Committee having sufficient funds to look after the basic interests of the universities and research doctors.

(e) *Are the results of research adequately disseminated?*

The problem at the moment is too much information coming from too many journals and being selective in information. However, many practicing doctors are so bombarded with information that they may not react to it.

The pharmaceutical industry uses its trained representatives to present selected information to doctors and this has been demonstrated to be a more effective means of communication.

(f) *How is unnecessary duplication of research effort avoided?*

Registers of research are counter-productive. In general just because a body is working on an issue does not mean it is likely to succeed and competition between different institutions is likely to be healthy and more likely to produce a correct result or corroborate information already obtained.

Centralised research in communist countries has historically been less innovative as a result.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

The average life expectancy of most populations in Western Europe is increasing and that is a good thing but does cause the problems already discussed, that is the problems of old age. It

is, therefore, important to improve the quality of people's lives but it is unlikely that increasing life expectancy will reduce problems, if anything it will increase them.

(h) *What changes in priorities in the training of medical researchers are needed?*

Universities have to be adequately funded and scientists have to have jobs to go to. These will include university jobs as well as jobs in the pharmaceutical industry. It is, therefore, important to be investing now in the scientists of the next twenty to thirty years. Recent cutbacks in university departments are not going to be helpful in any long term consideration of the health of the nation.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application in research?*

A rich country such as the United Kingdom should have adequate money to invest in research whereas currently the Medical Research Council say they are totally starved of funds. Adequate money leads to happy, contented and motivated scientists. Inadequate research money will lead to stagnation and frustration and ultimately to the transfer of research funds from pharmaceutical companies to alternative countries where the motivation and interest remain.

I hope these comments are helpful for your deliberations.

Stuart Dombey MRCP
Medical Director
May 1987

Memorandum by the Sunderland Polytechnic, Faculty of Pharmaceutical Sciences

1. *The Faculty Involvement in medical research*

The Faculty is composed of three departments, Pharmaceutical Chemistry, Pharmaceutics and Pharmacology, each with established research programmes in the Pharmaceutical Sciences and which would come under the umbrella of "medical research". It is important that the committee recognise that a great deal of medical research is carried out, outside of medical schools, in universities, polytechnics and commercial institutions. Our own involvement is briefly described below:

Pharmaceutical Chemistry (and Pharmacognosy)

The main thrusts of the chemical work is in the design and synthesis of drug molecules and current projects include work on anti-inflamatory, ATP-blocking and anti-tumour agents as well as research into drugs to treat tropical diseases. QSAR and molecular graphics simulation of drug structure and drug/receptor interactions play an important part in the projects.

Alongside the synthesis and design work the department is actively engaged in the development of a wide range of techniques for the estimation of drugs and other substances in pharmaceutical preparations, biological fluids and other biological samples. Special interests are in the development of MPLC, immunoassay and receptor assay procedures for drug analysis. The latter are a substantial and expanding area of biotechnology research in the Department.

Research on plants as potential sources of drugs continues with a new emphasis on tissue culture work—and an active involvement with clinical trials of herbal materials.

Within the department an Autism Research Unit is compiling information on Autism and carrying out research into possible causes of Autism.

Pharmaceutics

Research is carried out on surface phenomena and allied physical properties of drugs and formulations. Effects being studied include formation of liquid crystals and their relevance to emulsion formation. The investigation of formulations and dosage forms continues and emphasis has been placed on quality assurance and GMP in relation to the distribution of potent drugs in medicines. Computer simulations and various mathematical techniques are used for numerical analysis of pharmacokinetic data with the aim of optimising drug absorption from pharmaceutical delivery systems. Alongside these studies, investigations are in progress of the interactions of micro-organisms with pharmaceuticals. A new feature in this area is the design and action of drugs for the treatment of leprosy and the development of *in vitro* screening systems. Clinical pharmacy is an expanding area.

Pharmacology .

Current work is directed towards changes in ion movements across membranes as a result of diseases, especially of the immunoinflammatory variety. Other work involves the movement of ions as a result of the interaction of amines with specific receptors. The work includes studies of anaphylaxis and of cardiac

activity of selected compounds as well as the role of ions in immunological reactions. Other areas of work include studies of pancreatic secretion, the isolation of the polypeptide pancreotone and its physiological significance as an inhibitor of the pancreas and gall bladder. Studies are also being carried out on blood flow in the stomach, using histidine receptor antagonists to elucidate the role of histidine in the stomach and work is continuing into cerebral circulation.

The annex to note N/87/26 (dated 11.3.87) listed nine questions to which we were asked to make a response. I will not repeat the questions but simply list our replies under (a)–(i) and assume you have the original letter for cross-reference.

(a) Several criteria determine the priorities for research: the need for research to support the teaching programme in a university/polytechnic setting; the interests, expertise and commitment of staff; the current policies of grant-awarding bodies; and the perceived needs of the "community". Priorities within this institution have changed over the years in response to one or more of these factors. For example, since 1980 there has been more emphasis on practice-based research, in response to NHS needs; and the need to combat major tropical diseases led to the establishment of a Tropical Diseases Chemotherapy Research Unit (TDCRU). We anticipate a move to more multidisciplinary/interedisciplinary research in the immediate future.

(b) The balance is currently perhaps a little too much towards basic sciences and needs to be more towards an applied or practice based model although both strands are essential in a balanced programme. One cannot envisage yet further cut-backs of some areas to allow others to expand. The resources are generally allocated after peer-review of research proposals and not all the high quality a-rated proposals receive funding. The real answer must be to improve the amount of resource. On a world scale there are major diseases, particularly in the 3rd world, which are not being addressed on a sufficient scale by United Kingdom institutions. Perhaps its effect on the NHS would be minimal.

(c) Generally yes although inevitably there will be a delay between recognising the problem, finding an answer and implementing changes. The need for research to be more patient-orientated is being addressed. Work continues on diseases of major importance (for example cardiovascular) and moves into areas of growing importance (anti-viral) along with new techniques (immunoassay, receptor assay, etc). Lack of funding is the main factor in delaying the response to changing needs.

(d) Grants are generally for specific projects and funding, therefore, is only given to those projects which are prioritised both by the research institution and by the grant-awarding bodies. Changes in policy by bodies such as MRC/SERC result in similar changes in submitted projects by potential "customers". Industry needs to be more activity encouraged to support academic-based medical research and funding generally needs to be more flexible. Research cannot be simply turned on or off like a tap in response to availability of funds. Longer-term support of projects than the three year studentship or one–two years post-doctoral need to be considered.

(e) Generally yes but the multiplicity of outlets—journals, proceedings of conferences etc. can be a cause of delay, as can pressure of other work in institutions where research is just one activity alongside many others (such as teaching). The policy of this institution is to publish in international journals wherever possible whilst recognising that some work may not be published in order to protect possible patents etc.

(f) Unnecessary duplication is avoided by researchers keeping abreast of current literature and by personal contacts. Where there is possibility of overlap of interests researchers are encouraged to participate in cooperative projects. For example the Faculty has joint projects with a University Plant Biology group where their interest in medicinal plants and expertise in tissue culture is complemented by our interest in tissue culture and expertise in medicinal plant research. We question whether all duplication is "unnecessary", however, since some degree of duplication gives valuable confirmation of results.

(g) Yes, but there is a time-lag before information can be disseminated to all individuals who take decisions on patient care. Much medical research in long-term and fundamental in nature and, therefore its effects on patient care and health education cannot readily be assessed. Other branches of research, dealing with formulation, selection and use of medicines impinge more quickly on the NHS and are leading to improvements in health care (for example Clinical Pharmacy research).

(h) Pharmacy Practice research needs further development (see Nuffield Report). This not so much a change of priority as a need for further funding. There is a need in training/research to recognise the need for multi- and inter-disciplinary groups which have access to most of the up-to-date instruments and technical equipment, as well as to suitable groups of patients where appropriate. There should also be more integration of clinical and scientific disciplines at an earlier stage (postgraduates rather than post-doctoral).

(i) Special pharmaceutical funding is required via research councils to cover areas which fall between MRC (medicine) and SERC (science) interests. Commercial interests (pharmaceutical companies)

need encouragement to increase their support of research in academic institutions. Proper recognition needs to be made of the time required to initiate, manage, and participate in significant research programmes. The high quality of research is apparent, funding generally is inadequate and, in academia, there must be changes in the demands made upon staff who face considerable difficulties in maintaining research programmes alongside a multiplicity of other duties.

Memorandum by Professor K W Taylor, The London Hospital Medical College, University of London

I welcome the opportunity to comment on the position of Biochemistry with reference to medical research.

Biochemistry is the subject most basic to almost all branches of medical research, and cutbacks in funding are having severe effects in the United Kingdom. Most advanced countries such as Japan, the USA and most European countries are generally keeping up their level of financial support in real terms, and in many cases increased it. This is in stark contrast to Britain.

Consequently, there is a shortage of able research students (who are deterred by the ludicrously low rates of pay), and just as importantly there is a very severe shortage of able postdoctoral workers. The latter are the mainstay of research teams within Biochemistry. When vacancies are advertised for these positions, the response now is exceptionally poor. The reason for this lies in the appallingly poor career prospects for postdoctoral workers, there being an acute shortage of permanent positions.

It is to be hoped that a proper career structure for medical scientists, comparable to that for university academics could be established as a *matter of urgency* to prevent the loss of able people either to non-scientific positions or to countries abroad.

The Biochemical Journal is the chief journal publishing the results of British biochemists. About 50 per cent of its articles have some medical applicability. It is disturbing, therefore, that the proportion of papers in this prestigious journal coming from British sources has fallen to 15 per cent in recent issues, whereas more than half the articles originated from Britain ten years ago.

Memorandum by the Standing Conference of National and University Libraries and the National Health Service Regional Librarians Group

The National Health Service—Regional Librarians Group and the Standing Conference of National and University Libraries represent those librarians managerially responsible for library services in the National Health Service and the university medical schools respectively. Our involvement in research relates to the provision of information support to researchers and the effective dissemination of results. This joint submission reflects our desire to co-operate and pool resources to achieve our common aims. We wish to comment specifically on questions (e) to (i) of the Committee's open letter of 3 March 1987 and to raise four main issues:

1. There is a need for a consistent level of funding in support of libraries, which are a basic support service for research.

2. The need for a centre charged with the responsibility for coordinating information on current research and for the dissemination of results.

3. Greater importance should be attached to training researchers in the skills of literature searching.

4. There is a need for a consistent national policy on information provision at District level, in line with the NHS/DHSS Health Services Information Steering Group report of 1985.

Our comments are of a general nature, but we should be very happy to discuss any of them in more detail.

Dissemination of Results

Traditionally, results are disseminated through scientific and medical journals, and to a lesser extent through published or circulated reports. Subsequent access to these is by means of large-scale published indexes (often computerised) and through the local library collections and inter-library links. There are particular problems arising from the spiralling cost of journals, affecting both individuals and libraries, and the uncoordinated issue of reports which often fail to reach the appropriate indexes. There is also a national and European problem in that most of the indexing systems are American run and not always

hospitable to British and European requirements. Experiments with the use of advanced technology to combine computer indexes with electronic publication, seem to hold promise for the long term. More immediate gains may be made however by the effective use of existing technology. We see the problems as primarily organisational and attitudinal, and secondly as economic. A central facility for the dissemination of research results within the United Kingdom, linked to similar facilities elsewhere, could coordinate existing efforts and have an impact well beyond its costs. The more difficult economic problem is that of funding adequate journal collections in both the teaching hospitals and the health districts. If research dissemination is not to be severely hindered, authorities must recognise that this is an essential cost. Although the medical library does not need to take up a large proportion of the running costs of a teaching hospital or a medical school (£250,000 per annum would be typical), it is counterproductive to try to run such a service on the cheap or to make small but disproportionately damaging savings at a time when journal costs in medicine have risen by 126.3 per cent since 1981.

Avoidance of unnecessary duplication

The present structure for dissemination of research results, although imperfect, would permit most unconscious duplication to be avoided if it were effectively used.

That it is not always so used arises from two causes: lack of adequate local access to the necessary tools, and lack of adequate training of researchers in the techniques of literature searching. Local access to literature searching and to either good local collections or interlibrary loan facilities are essential to researchers both in the preliminary stages of research and throughout each project. This should provide not only forewarnings of possible duplication but also essential information support and ideas. Funding organizations would be well advised to check both that researchers have adequately researched the literature, and that they have access to continuing library support.

The avoidance of contemporaneous duplication requires more specific provision, although this need not be costly. A central register of ongoing medical research could be modelled upon the Index of Nursing Research maintained by the Department of Health and Society Security. Key features of this are input from the main funding bodies and from individual researchers, integration with the established indexes and abstracts of results, and links with the library service. Ease of access to the register would of course be crucial. Such a register could be part of the work of a central facility for research dissemination. This might, for example, involve an extension to the existing role of the British Library.

Application of medical research to patient care

Research results filter into the practice of patient care by several routes, including the increasing integration of clinical research with practice and the rotation of clinical staff through research posts, as well as by more conventional educational and training routes. In the literature, research results are frequently filtered though review articles and case reports before achieving consensus recognition. Such filtration is essential if patients are to be protected from the premature application of misleading, inaccurate or even fraudulent results. However, well established knowledge should be applied as early and effectively as possible, and we are concerned that the network of libraries in the National Health Service is still rather patchy and often ill-equipped to provide a reliable support to this process. Well managed and properly resourced libraries in some health districts are making a major contribution to the flow of new knowledge into clinical practice. The report "Providing a District Library Service" has put forward suggestions for extending this benefit to the whole country at a low cost, and we would like to see it adopted as a national policy within an overall programme for the improvement of patient care.

Health education and information support to patients

Systematic provision of reliable research based information to patients, their families and the general public is in its infancy. A few health districts have begun such provision either within a district library service or through a department of health promotion, and we would be happy to supply details of these. We are keen to see these initiatives encouraged and evaluated and, where appropriate, initiated. We are also keen that it should be a joint responsibility of clinical staff, health educators and librarians to ensure that information relevant and useful to patients and the public should reach them in a form that is both reliable and understandable.

Priorities in the training of medical researchers

We have already touched upon the inadequate expertise of many researchers in the matter of literature searching. We regard this as one of the most fundamental of research skills yet it is rarely taught or performed with the professionalism it requires. A good literature search is often the result of a partnership between a researcher and an information professional. In any case all researchers should be aware of the facilities available, their uses and limitations, and the ways in which they are changing through the implementation of information technology. A specific problem is the growing tendency to search only the most recent literature and to miss valuable older work. Computer searching has exacerbated this and there is a special danger that anything "pre-Medline" is missed.

Changes in organisation and funding

We hope that in considering the organisation and funding of medical research your lordships will also consider the organisation and funding of support services such as libraries. We believe that libraries have a crucial part to play in coordination of research, and in the support of ongoing projects, and in the dissemination and take up of results. Libraries themselves however require attention in all of these areas.

Library support for medical research comes from the university and NHS sectors, which we represent, and also from the research councils, professional associations, and the private sector. We should like your lordships to consider the potential advantages of a national framework to coordinate the provision and use of libraries within and between these sectors, to encourage cooperation, discourage wasteful duplication, and to provide central facilities such as we have mentioned above.

We should also like to see firm guidance at national level to encourage open access to facilities and services across sectoral boundaries. Along with this should go participation by university medical libraries in schemes of library cooperation based on the NHS regions, thus overcoming some geographical barriers affecting access to major resources.

The take up of existing library resources could be improved if funding bodies were to insist on all researchers showing evidence both of effective preliminary use of the literature and of access to adequate information support. Where this is not available, it should be an integral part of the funding of research to provide it.

Conclusion

We are keen that our library services should contribute effectively to all stages of the research process. To this end we have tried and will continue to try to improve provision, reduce waste, coordinate resources and educate users. We welcome your lordships initiative and interest and hope that you find our comments useful. We should be very happy to provide further detail on any areas of particular interest.

Derek Law
Chairman, Advisory Committee on
Medical Materials
Standing Conferences of National
and University Libraries

Michael Carmel
Honorary Secretary
National Health Service Regional
Librarians Group

References

NHS/DHSS Health Services Information Steering Group
"Providing a District Library Service".
King's Fund Centre, 1985.

May 1987

Memorandum by the University of Edinburgh, Department of Nursing Studies

COMMENTS PERTAINING TO NURSING RESEARCH

General comments

These comments are submitted in response to a request by letter at the end of July from the Clerk to Sub-Committee II. The letter stresses that the Sub-Committee's enquiry relates to any research connected with the health professions. While this broad view is to be welcomed, it appears that the Sub-Committee's enquiry was restricted initially to priorities in medical research and it would be unfortunate if nursing research was subsumed within medical research and given only secondary consideration. Although there is value in considering NHS-related research collectively, it is essential also to consider the independent research of each health care profession separately. A separate enquiry into nursing research, conducted along similar lines, would be most useful and perhaps the Sub-Committee might consider making such a recommendation. There is a need for discussion at national level about priorities for research in nursing and for the development of policies aimed at expanding opportunities for research training and increasing the quantity of nursing research. Although nursing research has developed rapidly and in positive directions over the past 15-20 years, the number of nurses equipped to undertake research is woefully inadequate given the size of the profession (62,563 nursing staff in Scotland in 1985) and the amount of funding for research in nursing is negligible compared with the costs of nursing services (35% of the total net revenue cost of the NHS in Scotland is attributable to nursing services: for example £458,484,000 cost of nursing in 1985). There is an indisputable need for increased resources for, and coordination of, nursing research in the United Kingdom in order for it to have potential to contribute towards the improvement of nursing care, nurse education and the management of nursing services within the NHS.

Comments on set questions

The specific questions on which the Committee invited evidence are geared towards medical research but comments are offered here as they relate to nursing research.

(1) *How are priorities for medical research set? . . .*

There has been no coordinated effort within nursing to determine priorities for research and this would be a useful exercise in order to maximise the use of the limited resources available. There has been a perceptible move over recent years towards an emphasis on research which is directly relevant to nursing practice, reflecting nurse-researchers' own views on priorities and to a large extent this is how priorities are set at present. Efforts to obtain the views of members of the nursing profession on research priorities have been made through Delphi surveys and such a survey is underway in the Nursing Research Unit at present.

(2) *Is the present balance between different branches of research right? . . .*

Research in nursing is not yet of a scale allowing specialisation and it could be assumed that priorities would emerge in the light of increased resources. All branches of research in nursing merit higher priority—in general hospital nursing, community nursing, midwifery, health visiting, psychiatric nursing, paediatric nursing . . . and all other specialities—and there is also a need for priority to be given to the development of basic research and biologically-based studies as well as continued development of applied research and studies within the disciplines of social sciences.

(3) *Are priorities in medical research adapting to changing incidences of disease, changing population structures, and new technology?*

Nursing research is not entrenched in any established patterns and so is flexible to adapt, although is constrained in doing so by lack of resources.

(4) *How are priorities in medical research influenced by institutions through which research is funded? . . .*

Nursing research remains almost totally reliant on Government funding and, therefore, inevitably has been influenced by SHHD/DHSS stated priorities for health services research. There is no reason to believe that charitable funding would affect priorities in nursing research and commercial funding need not either, assuming nurse-researchers retain control of their research endeavours.

(5) *Are the results of research adequately disseminated?*

Yes, on the whole. Nursing research is reported in professional journals and at meetings and conferences, both locally and nationally. Nurse-researchers are aware of the need to disseminate research findings as widely as possible throughout the profession.

(6) *How is unnecessary duplication of research effort avoided?*

Duplication is not a real problem given the small amount of research in nursing. It is avoided by research centres (for example academic nursing departments and nursing research units) ensuring knowledge of each others' work.

(7) *Is research reflected as it should be in actual improvements in patient care . . .?*

The potential for direct application of research findings has been limited due to the exploratory, descriptive and small-scale nature of much of the research in nursing to date. There is evidence that research has influenced nursing practice in local situations but there is scope for more consideration to be given to research findings at the level of policy-making.

(8) *What changes in priorities in the training of medical researchers are needed?*

With regard to nursing, there is a need for expansion of research training (both in terms of quantity and diversity) and perhaps particularly for the support of NHS-employed nurses to become equipped to carry out research within their work situation. The SHHD and DHSS nursing research training schemes (initiated in 1967) are extremely important but too limited to make a significant impact on a profession as large as nursing.

(9) *Should any specific changes in organisation or funding be made . . .?*

There is a need for the setting up of an organising/coordinating body for research in nursing at national level. This could assume responsibility for coordinating research developments in nursing and working towards a larger and more diverse funding base for research, including attention to the fact that there is as yet no locus of funding for nursing education research. In addition, it would be helpful for nursing research if nursing was better represented on grant-giving bodies, ethics committees and other organisations involved with health services research.

These comments have been prepared by:
Dr Alison Tierney,
Director of the Nursing Research Unit,
Department of Nursing Studies,
University of Edinburgh
and are submitted on behalf of the Department of Nursing Studies, University of Edinburgh: Head of Department—Professor P Prophit.

September 1987

Research in the Department of Nursing Studies, University of Edinburgh

The Department of Nursing Studies was formed in 1956 and provides both undergraduate and postgraduate nursing courses. The Department is also a major centre for postgraduate research, with over 30 students currently studying for MPhil or PhD research degrees. The Department has a distinguished record in pioneering research developments and, in 1971, a Nursing Research Unit was established in the Department financed by a grant from the Scottish Home and Health Department. The Unit—the first of its kind in the United Kingdom and Europe, and internationally known—is committed to undertake research relevant to nursing and to organise educational activities related to research for nurses in the National Health Service. Currently, the Unit's core programme of research is concerned with nursing practice issues and current projects relate to the nursing care of disabled people in the community, the care of postnatal mothers at home, the problems affecting sleep in hospital patients and the nursing management of cancer patients receiving chemotherapy. The current level of funding for the Unit is £160,000 approximately. In addition to the Unit grant, the Department holds several other major project grants and has a variety of research studies underway by members of staff of the Department. Although the Department's research is concerned primarily with nursing, there has been and continues to be close collaboration with researchers in other disciplines and other health care professions.

A J Tierney

Memorandum by the University of London, University College and Middlesex School of Medicine

(a) How are priorities for medical research set? How do these reflect the particular needs of the National Health Service, or more generally the health needs of the nation?

In clinical research priorities relate to perceived needs. Research projects start with patient oriented clinical problems. Research in such cases can be seen as response to Health of the Nation issues for example, thalassaemia. In non-clinical research grant-giving bodies influence patterns of research—programmes are formulated with basic scientific proposals in mind rather than specific clinical objectives. Many organisations at many levels are involved in setting priorities. In general non-clinical research supports clinical research.

(b) Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back, in order to allow those which should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?

Medical research is not directed by a coherent overall policy or formal strategy. Rather it is a response (often belated and sluggish) to perceived needs and its priorities are set by the money that is available. The peer review system is largely responsible for this situation. For instance epidemiologically based research does not get a high priority amongst funding bodies. There is a view that much research council money goes into basic medicine and not enough to clinical research. However, NHS research committees tend to support the less "popular" areas for example, psychogeriatrics which tends to be neglected by MRC etc. Health service research is poor and has suffered but it is more "directed" than other research (for example AIDS). Peer review system of research applications does have benefits in that it can reduce the amount of duplicated research and can permit findings by one group to be verified by another.

Assuming resources are limited projects that fail to show early progress should be wound up. Lack of ongoing review is serious drawback at present—money wasted on poor programmes. Research should be assessed rigorously after 12 to 18 months and those programmes that are not fulfilling work plan or are deemed to be otherwise unsuccessful should be axed.

Assuming increased resources, unlikely priorities would change—more likely do the same but in greater depth.

(c) Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?

Yes

(d) How are priorities in medical research influenced by the institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?

First half of question—comments under (a) above.

The institution formulates a series of research plans which essentially represent the research interests of the people in its Departments. UCL's policy is to establish strong Departments and encourage them to co-operate and collaborate. Hence balance affects priorities at Department level rather than at the level of institutional policy-making.

(e) Are the results of research adequately disseminated?

Nationally yes, but need for improved worldwide dissemination of knowledge. Time lag in hearing results of research in non-English speaking countries (even in Europe) is the main problem. English language journals are central.

(f) How is unnecessary duplication of research effort avoided?

Majority of the funds are governed by experts in the field. Peer review system again operates.

(g) Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?

May be a problem in translation from research to practice (for example, getting NHS to allocate funds for translating new developments into routine service). Development of a vaccine is of immediate benefit to the patient but research does not always have such immediate tangible results. Need for cost-effectiveness is a major difficulty, also problem of getting health education message across to public at large (for example, alcohol, tranquillisers).

(h) What changes in priorities in the training of medical researchers are needed?

Need for more clinical scientists. Clinical academics do not get proper training at present—no career programme. Intercalated BSc year gives a medical student some relevant experience—however, the reduction of MRC funding for this poses a real threat to this supply of clinically trained research workers. An increase of resources to support a career structure for people entering this field would be welcomed. Many consultants have only undertaken research as part of their early medical training. Very few MRC courses and tend to be built around individuals—not successful when divorced from academic departments. It would be better if MRC supported a number of smaller projects on a long term basis associated with academic centres and not put everything into one basket as it did with Northwick Park. Some would like to change a lectureship into a clinical scientist post but uncertainty re continuity of charitable funding undermines possibility.

(i) Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?

Major constraint is that funding is not sufficient. It is the lack of funding that creates the "Flavour of the Month" syndrome at the MRC not any inherent fault in the organisation. It is not a question of lack of good ideas.

Additional letters from the Trent Regional Health Authority

Following the meeting in Sheffield on 17 July 1987[1] you asked for a brief note about the way in which we meet the financial implications of medical research. Earlier I had explained that (a) Trent's available income for medical research had increased as a result of the RAWP policy and implementation and (b) most of the demand for funds for medical research comes from the three Teaching Districts and their associated Medical and Dental Schools.

I should have added that the Teaching Districts income is augmented by SIFT (Service Increment for Teaching); this currently amounts to about £29,000 p.a. for each medical student in the clinical years. This is equivalent to about a 10 per cent addition to the Districts income. Unfortunately, this "extra" money is applied indiscriminately to "improve" the environment generally rather than specifically.

Our next planned move is to enhance the Teaching Districts financial targets by 1–2 per cent in recognition of their continuing centre of excellence activities. It is hoped that these funds will be applied

[1]Evidence published in Vol. II, p97.

to specific objectives. This proposal has been agreed informally with all 12 Districts and will be put to the RHA for ratification and incorporation in its guidelines in 1988.

I trust these points will be helpful.

J A Scott

July 1987

Sir Michael Carlisle has asked me to reply to your letter of 17 November 1987. Following my enquiries I am advised that the Region's expenditure on Commercial Management Consultants who were retained to advise on operational matters affecting clinical services was as follows:

1986–87 (actual)	£52,591
1987–88 (estimate)	£80,570

These figures fall far short of the £200,000 budget I gave to the Sub-Committee and the explanation is that the balance is met by the cost of work undertaken by "non-commercial" bodies and individuals. In particular we have set aside £50,000 p.a. to underwrite part of the cost of York University's health economics service; a substantial part of this commitment is likely to be met by the Region's District Health Authorities but the cost to the Region—as a whole—will be the same. The balance of expenditure arises from specifications of work undertaken by individual workers, the majority working under the aegis of University Departments within the Region.

I hope this information is sufficient to meet your needs but I will endeavour to amplify any point should this be required.

J A Scott

December 1987

Letter from the University of Edinburgh, Department of Medicine, Royal Infirmary

We are sure you will be aware of the current difficulties facing clinical scientists who hold honorary consultant contracts with the National Health Service. We are all actively engaged in clinical medical research at a senior level and direct our own extensive programmes of research whilst also fulfilling a clinical service role as honorary NHS consultants. We are, however, all on fixed-term Senior Lecturer or Senior Research Fellow contracts with the University of Edinburgh, and funded by bodies other than the UGC—namely the Wellcome Trust, British Heart Foundation, Salvesen Trust, and the Arthritis and Rheumatism Council. There are similar individuals in all United Kingdom Medical Schools, who, like us, could be termed "career" clinical scientists.

May we draw the Committee's attention to the lack of any current UGC funded career structure for clinical scientists in this country? We are most grateful to our sponsoring bodies for their present essential support. However, at the end of our fixed appointments we will have to seek fresh sources of funding. This is because the fixed contracts were, in most cases, originally offered in the expectations that appropriate University tenured posts would be available at the end of our contracts. In practice, this has not happened because of financial cut-backs in University funding. This has been damaging to morale and meant that: (1) time that could have been spent in research effort has to be used in trying to find funding for our own future salaries, (2) it is impossible to pursue long-term research objectives effectively when the position of the senior investigator is insecure.

We would like to ask the Committee to consider, in depth, the special difficulties that recent financial cut-backs have posed for senior clinical academic staff such as ourselves who wish to continue their careers as clinical scientists and yet for whom there is no appropriate permanent funding mechanism under either current UGC or MRC provisions. We would urge the Committee to recommend that four or five new posts of career clinical scientists be set up as a matter of great urgency in each United Kingdom medical school, so that those of us who provide a vital part of the clinical research impetus in British universities can be retained to work within the university and NHS framework.

The total cost of such a proposal would be small (£3–4 million per year), but would help to preserve the rapidly shrinking academic base of clinical science in this country. We would stress that this is an

acute problem which demands urgent remedies. If it was felt appropriate, one or more of us would be prepared to provide real oral evidence to your Committee.

D J Ewing MA MD FRCP
Wellcome Trust Senior Lecturer in Medicine and Honorary Consultant Physician

G W Duff MA BM PhD MRCP
Senior Lecturer in Medicine and Honorary Consultant Rheumatologist

D C Russell MA MD PhD MRCP
British Heart Foundation Senior Research Fellow, Honorary Senior Lecturer and Honorary Consultant Physician

W Macnee MD MRCP
Senior Lecturer in Respiratory Medicine and Honorary Consultant Physician

April 1987

Memorandum by the University of Exeter, Postgraduate Medical School

The Postgraduate Medical School of the University of Exeter is unique. It was established in 1963 as the first postgraduate medical academic unit in a university without an undergraduate medical school and was the first development of its kind in Western Europe.

One of the main functions of the Exeter Postgraduate Medical School is to undertake research, so the School welcomes the opportunity to give evidence to the Select Committee of the House of Lords.

STAFF

The staff of the Postgraduate Medical School, on 1 May 1987, will consist of:

Professors	3	(in general practice, histopathology and child health)
Senior Lecturers	16	
Lecturer	1	
Research Fellows	16	
Research Assistants	3	
Secretarial Staff	11	
Computer Programmer	1	

Unlike most medical schools, all the academic staff work part-time in the University and also work simultaneously in the National Health Service, either as consultants or general practitioner principals. The one member of the senior academic staff who is not medically qualified, also has a part-time appointment with the University and is Principal of the St. Loyes School of Occupational Therapy.

This unusual arrangement of entirely part-time staff gives this School special advantages and has contributed to its progressive development during the last 25 years. In particular it has enabled an interesting and unusual set of partnerships to emerge:

between academic staff and the practising professions;

between different specialties, both inside and outside the hospital;

between the medical and the allied health professions;

between the health professions and health service authorities (especially the Exeter Health Authority).

REGIONAL FOCUS

There are only two universities in the South-Western region, Bristol and Exeter, and Bristol is situated at the eastern end of a very long peninsular. The Exeter Postgraduate School is thus well sited as a focus for research, particularly in the counties of Devon and Cornwall.

EXTERNAL GRANT SUPPORT

The School has attracted external grant support of about £2½ million and its external project support in the current year is about a quarter of a million pounds.

RESEARCH UNDERTAKEN

Medicine

The first Director and Deputy Director were both consultant physicians so the first topics studied included fluorimetric estimation of plasma steroids and this work is continuing in a new laboratory. The work of the Senior Lecturer in gynaecology is related as he researches the management of toxaemia and the use of lasers in gynaecological surgery.

A Senior Lecturer is researching the small airways function in myocardial infarction and working with a Senior Lecturer in Community Medicine on the identification of coronary risk factors in children and development of health education material for schools.

There have been several publications on research supported by the Medical Research Council on the nature of the immune complex in rheumatoid arthritis. The most recent appointment to the staff is another consultant physician who is coming from a Wellcome Senior Lecturership at Charing Cross and the Westminster. He will study the nature of diabetic complications in the capillaries and research into the optimum way to organise a district-based service for diabetics.

Pathology

The Professor of Pathology contributes to the research standards of publications in this discipline through being on the editorial board of all four of the leading pathological journals and editing Recent Advances in Histopathology. His research on the liver is widely cited and led to his becoming a World Health Organisation consultant. A new Senior Lecturer in Pathology is now continuing work started in South Africa on the pathology of the nervous system damaged in head injuries.

Cancer Care

The diagnosis and care of patients with cancer is another research priority. One Senior Lecturer is investigating the process in which cancer is diagnosed in general practice, where it usually presents, and has negotiated access to the medical records of half-a-million patients in Devon. A Senior Lecturer in Oncology is pioneering the home treatment of patients with advanced malignant disease; details of favourable results have been published.

The Care of the Elderly

The Senior Lecturer in the Care of the Elderly has been involved in establishing a DHSS Demonstration Centre in Exeter. Health Service research in this field has included a study of the care of the elderly in general practitioner hospitals.

Anorexia Nervosa

A substantial group of patients have been studied by both the former Director and Consultant Physician and the Senior Lecturer in Psychiatry. A book is in preparation following several articles.

Child Health

Child Health has developed an international reputation in Exeter following the leadership of the Professor of Child Health. He established a department within the Postgraduate Medical School in which two Senior Lecturers and a Lecturer continue to research the needs of handicapped children, the needs of young disabled people and problems of pregnancy in teenagers.

The practical output of this work in terms of the care now provided for handicapped children is a good example of how local academic research can quickly lead to improved services for patients in the National Health Service. Over a million pounds has been attracted to this Department.

General Practice

The largest department within the Postgraduate School is General Practice, which was the first postgraduate department in a university in Europe. It now has the first Professor of General Practice in Britain in a postgraduate unit, four Senior Lecturers, including the first Senior Lecturer in a British university from the remedial professions.

CITATIONS

Books

For the sake of brevity the hundreds of references to the publications from the staff of the Exeter Postgraduate Medical School are not listed, but details can be given on request. There have been 25 books written or edited by the staff.

CONCLUSIONS

Analysis of the work of the Exeter Postgraduate Medical School shows that there are important opportunities for academic staff based in universities in the provinces to make substantial contributions to medical knowledge. This can be done, as it has been done in Exeter, in laboratories, in hospital medicine, in general practice, and in the work of the professions allied to medicine.

The particular strengths of a medical school like Exeter lie in the application of academic analysis and research to the problems experienced in everyday clinical practice in the National Health Service.

This medical school has concentrated on applied research. The main contributions to the literature have led to alterations in clinical and educational practice and in providing working models which have been

copied elsewhere. Because it is a relatively small school, it can identify growing points such as the needs of handicapped children and general practice education and can respond quickly by researching them.

The Exeter Health Authority funds several of the senior staff appointments and the School has forged a unique working partnership with its local health authority (which is not a teaching district and is thus representative of the great majority of Health Service districts).

PRINCIPLES

Two general principles stand out:

1. *Fundamental and applied research*

First, there needs to be a sensitive balance between fundamental and applied research. Both are essential to ensure maximum effectiveness in the creation and dissemination of new knowledge.

On the one hand, fundamental research is always necessary, and a continuing need. The United Kingdom has a distinguished record of original contributions to fundamental medical knowledge. However, applied research is equally valid and equally important. It finds out new knowledge about the best way of helping patients through applying knowledge. It includes operational research, which often exposes difficulties or blocks in health care delivery, which can often be changed to improve care for patients. It is also essential and has been under-emphasised and under-funded in the past.

Centralised and de-centralised research

Conventional wisdom suggests that research work and research workers should be concentrated virtually exclusively in centres of excellence. There are strong reasons for doing so, but there are centres of excellence in many parts of the country.

It is inherently unlikely that the needs and systems for say, the care of the elderly in rural communities, can be optimally researched from London. There are many topics like diabetic care, the surgery of hip replacement, and health promotion which can be well tackled in a setting like Exeter.

The advantages of conducting research with enthusiastic staff who also play an active role in the care of patients and who are seen as part and parcel of the local medical community, gives great local encouragement and may create considerable new resources.

However, organisations like the Postgraduate Medical School do have to swim against the tide in the sense that they do not have core funding for staff, either academic or supporting and many grant-giving bodies exclude such costs from their grants. It may thus be particularly difficult for academic staff in organisations like this to sustain grant support.

Local charities have substantially supported local work in this medical school. The general practitioners of the South Western region, for example, are currently covenanting sums which will produce over £100,000 for the further development of university general practice. At a time when central, Government-controlled funds are at a premium, flexible institutions like the Exeter Medical School may be best placed to undertake research on local problems, to encourage and stimulate local colleagues (which may have a valuable influence on morale), and also increase the total funds available nationally for research.

The key principle which needs to be recognised and supported is the need to decentralise research centres and to recognise a strong case for diversity.

April 1987

Appendix

EVIDENCE PROVIDED BY A SUB-COMMITTEE OF THE SENIOR ACADEMIC STAFF AT THE POSTGRADUATE MEDICAL SCHOOL OF THE UNIVERSITY OF EXETER

QUESTION 1

Priorities for medical research are not usually set in any considered way. Individual grant giving bodies may set priorities within their area of interest; in the case of the Medical Research Council and certain other bodies these areas of interest may be wide. Much other research is carried out with monies from foundations with specific areas of interest and these special interests may have a greater overall effect on the distribution of funds than any considered priorities. The distribution is thus likely to reflect public interest and public appeal to certain causes rather than the needs of the population. Examples would include the little amount of research into chronic bronchitis compared with cystic fibrosis, or into multiple sclerosis as opposed to dementia.

QUESTION 2

The balance between preventive medicine which may in theory be more cost effective but the humanitarian need for research into curative medicine is fundamental and there is no easy resolution to this problem. Answers given to Question 1 are also relevant.

QUESTION 3

Priorities in medical research do adapt to changing incidence of disease and demographic need but this may be a slow process and dependent for example on the setting up of a new charity to promote research in a particular area. It is easy to attach research to either new technology (including drugs) and newly described conditions.

QUESTION 4

The short answer is that both the style and interest of the institution and the source of monies affect research content very considerably, the long answer is covered in other question.

QUESTION 5

There are ample facilities for dissemination of research, particularly to other researchers. Dissemination to the end user of medical information is considerably slower, but we accept that it is generally adequate when a major research finding of fundamental importance is involved. Dissemination is rapidly aided by commercial sponsorship so that if there is a commercial interest in the results this will be rapidly made known.

QUESTION 6

As the question implies, we would state strongly that duplication is by no means always unnecessary or undesirable and may be extremely productive. Opportunities for good exchange of information between researchers is essential and such opportunities need to be both encouraged and financed.

QUESTION 7

This relates to Question 5. Research findings may not be known to, understood by or accepted by the service provider, that is the first line medical practitioner. This problem is important and highlights the needs for continuing education of medical personnel. Dramatic improvements are often adopted quickly; for example in laboratory medicine, the technique of immuno-assay has been widely adopted and applied.

QUESTION 8

Formal training in research for medical practitioners is poor though good in some major institutions. Career structure in medical research is extremely unsatisfactory and a period of research may be a significant disadvantage on the "main" career ladder of the candidate. Experience of the theory and practice of medical research is essential to the good practice of clinical medicine and receives a low priority in both undergraduate and postgraduate curricula.

QUESTION 9

Considerable progress could be made towards better funding for appropriately directed research by a substantial increase in NHS funded projects. Both nationally and locally a very small proportion of government health expenditure is invested in research to meet the needs of patients. Such investment might be considered equivalent to the research and development budget of a normal commercial company. More use could be made of locally organised research initiatives.

Without considerable investment by the parent authority (the NHS) both in the funding and other support of medical research, it seems unlikely that major changes in the direction or control of research towards the needs of the patient are likely. The present arrangements produce good research as it cannot be considered that they are anything other than an ad hoc system.

Letter from the University Hospitals Association (England and Wales)

I am writing on behalf of the Association whose constituents will have responded to the nine specific questions posed by the Sub-Committee.

We would, however, draw the attention to the Sub-Committee to the results of the Association's Academic Staff Survey carried out by the Statistical Unit to demonstrate the effects of diminishing UGC funding on the overall academic staff between 1981 and 1987 which shows a loss of 39.12 whole-time

equivalents in the technical and MLSO grades. This is a very serious loss of support staff which has a profound effect on the ability of departments to carry out research and may therefore seriously distort priorities in research.

L D Abrams
Chairman

April 1987

Memorandum by the University of Liverpool Faculty of Medicine

INVOLVEMENT IN MEDICAL RESEARCH, AND OUTLINE OF PROGRAMMES AND PRIORITIES

The Faculty of Medicine at the University of Liverpool has a long tradition of excellence in biomedical research. It is the policy of the Faculty to continue research of the highest standard in both basic and clinical research. In basic biomedical departments there are groups with high international reputations working in neurobiology, secretory mechanisms of the gastrointestinal tract (supported by the MRC Secretory Control Group), and pharmacology. Research is conducted in all the major clinical specialities; particular strengths at the present time include the development of magnet resonance methods for imaging and spectroscopy, immunology, surgical research in breast cancer and gastroenterology, pulmonary vascular pathology, neuroscience—especially pain relief, tropical medicine particularly the application of advanced molecular biological and immunochemical methods, and neonatal research. In addition there are several multi-disciplinary developments that we regard as important to our research profile, notably the research work of the Institute of Medical and Dental Bioengineering, and the Institute of Human Ageing.

Programmes of research are initiated at departmental level except insofar as they involve collaborative or multi-disciplinary approaches. High priority is at present given to maintaining the existing research strengths of the Faculty, although there is a continuing awareness to identify emerging areas of excellence. A variety of performance indicators are used to determine research strength, of which the raising of outside funding for research, notably from the Research Councils and major medical charities, and the publication of papers in high impact peer-review journals deserve special mention. We would like to be more active in identifying and supporting major new areas of research that deserve priority, but the present lack of funds is a major constraint and in effect we are faced with the problem of only keeping pace, rather than breaking new ground.

REPLIES TO SPECIFIC QUESTIONS

(a) *How are priorities . . . set?*

Heads of Departments are responsible for developing research programmes in the first instance. The Faculty Research Committee reviews and promotes research in the Faculty as a whole. It monitors the research profiles and plans of individual departments, identifies priorities and makes recommendations on the allocation of resources. The University Research Committee is able to support selectively some research in the Faculty and takes into account Faculty priorities in reaching its decisions. The membership of the Faculty committee includes clinical academic staff with honorary NHS appointments. The particular needs of the Health Service are in any case well known to individual Heads of Departments in the clinical specialities who hold honorary NHS appointments, and additionally may advise on or manage areas of clinical service to the District, Region or DHSS.

(b) *Balance between different branches*

A balance between basic and clinical aspects of biomedical research is of fundamental importance to the development of both. In these terms, we regard our present research portfolio as reasonably well balanced. Of necessity our priorities are to maintain existing strengths; if increased resources became available it would enable us to promote new and relevant areas of research in addition to relieving the pressure on existing areas of excellence.

(c) *Are priorities . . . adapting?*

We have been able to initiate several new developments that should go some way toward meeting the challenge of changing populations and disease. New Chairs have either been approved or are at an advanced stage of planning in Clinical Bacteriology, in the Psychiatry of Old Age, in Child and Adolescent Psychiatry, in Foetal and Infant Pathology, in Nursing, and in Tropical Paediatrics and International Child Health. We regard these as important not only because they meet the health needs of the community and our teaching responsibilities, but also because they will allow us to develop a research base in these areas. However, it should be made clear that these new developments have been made possible largely by funds from non UGC sources and would not have been possible on the basis of University support. Other initiatives that we regard as important responses to changing needs in the community have not yet been supported—one example is a proposed Chair in Addiction Studies.

Regarding new technology, our Institute of Medical and Dental Bioengineering is active in the development and application of new technology in the biomedical area; in the Faculty of Science, new developments in molecular-biology and biotechnology have been a particular strength in recent years and involve inter-faculty collaboration.

(d) *How are priorities . . . influenced?*

The Research Councils, medical charities and the pharmaceutical industry are important sources of external support for our research. In different ways each of them influences priorities. University priorities, as mentioned above, are determined in part by success in fund-raising elsewhere. There is a danger here of a vicious circle being generated, whereby failure in outside fund-raising prejudices internal support. In the long term this is likely to be a major problem in raising support for truly innovative ideas—which by definition might appear strange and irrelevant when they first emerge. In former times when University support was more bountious genuinely novel work had a better chance of getting started. The balance between different types of support is not at present a major factor in setting priorities, but we take particular note of support that includes rigorous peer-review for example Research Councils. The support from medical charities and industry is providing an increasing proportion of our external income, and has an additional direct influence on research priorities. Virtually without exception, both charities and industry have identified areas that they wish to support; there is a danger that important new areas will be under-funded because neither charities, nor the pharmaceutical industry can see their immediate applications. Finally the University may find itself unable to match in any way the outside support from the medical charities.

(e) *Are results adequately disseminated?*

Publication of results in high-impact peer-review journals is one of the ways that we monitor research activity. This encourages publication. Staff are also active nationally and internationally in presenting research findings at conferences and symposia. Some financial support for travel for these purposes is available through the Staff Travelling Fund. We have no evidence that research in this university is not being adequately disseminated.

(f) *How is unnecessary duplication . . . avoided?*

It is almost impossible to find funding for research that duplicates existing work, and it is similarly difficult to publish duplicated work in good journals. Both factors act as a strong disincentive to unnecessary duplication of research activity. Resources at a local level will not be committed to duplicate work.

(g) *Is research reflected . . . in improvements in patient care or health education?*

Clinical academic staff with honorary NHS appointments are well placed to translate their research into patient care. There is, however, a major problem here: resources for NHS implementation are frequently difficult to obtain. Staff involved in clinical research find themselves in the position of first needing to raise support for their research, and then when it is successful being faced with lack of NHS funds to implement and apply their results. The research activities of members of staff in both pre-clinical and clinical departments is considered complementary to teaching. Research, therefore, has a direct impact on the training of new doctors. In addition, at both departmental and faculty levels there are special lectures which have the specific aim of bringing the latest research findings to the attention of medical students.

(h) *What changes are needed in the training of medical researchers?*

There is presently a major problem in training of research workers in the biomedical sciences. The problems are different for clinical and non-clinical researchers, but are acute in both cases. In this university, clinical research workers have in the past generally done an intercalated BSc honours course in a pre-clinical subject prior to their clinical training, and have then done one or more years of full time research training during the early part of their clinical careers. Both of these training steps are now in great peril. The intercalated BSc honours course has been supported by the Medical Research Council. However, this scheme is now being wound-down by the MRC. Two years ago we were allowed to make over twenty awards, last year 17, this year 12 and two years from now there will be only seven. The intercalated courses are specifically designed to teach the basic skills of scientific research in a biomedical context; they have also provided the first experience of conducting research for some of our best medical research workers. The advanced research training of clinicians is in further danger, because the demands of professional clinical training make it difficult to find adequate time for research. At the moment, the intense competition in clinical specialities is such that well motivated and able young clinicians who in the past would have done research are reluctant to take time learning research skills for fear that they will not be able to re-enter the competitive clinical stream. Implementation of the Hayhoe report is likely to make the situation worse. If the present trends continue uncorrected it is almost inevitable that trained clinical research workers will virtually disappear in the next generation.

There are also problems with the career structure of non-clinical research workers in the bio-medical sciences. The poor rewards and uncertain employment opportunities after the post-doctoral level are presently detering talented young graduates from entering biomedical research and are encouraging those that do enter to leave the country at the earliest opportunity.

(i) *Should specific changes in . . . funding . . . be made?*

The traditional dual-support system that has operated here in the past has many strengths, and on past record is well able to generate high quality research. The primary problem at the moment is that financial support from both the UGC and the Research Councils has been cut back so that neither side is able to meet its responsibilities for supporting research in the Universities and Medical Schools. What is needed most urgently for the promotion of research of quantity, quality and relevance is a commitment to adequate funding and to stability. Complex and difficult research problems cannot be taken and dropped at short notice. The present uncertainties in funding through both arms of the dual support system are inhibiting good research because the continuity needed to tackle large and significant problems is in doubt.

Letter from the University of Liverpool, School of Dental Surgery

I am writing, in my capacity as Chairman of the Research Committee of the School of Dental Surgery, in response to the request for submissions to the above Select Committee in connection with their enquiry into priorities in medical research. I understand that dental research is to be included in this enquiry. I set out below the statement describing our involvement in dental research, as requested in the letter of the Clerk to the Sub-Committee dated 16 March, and my brief answers to the questions. I should point out that this submission is necessarily brief in view of the short time scale.

The School of Dental Surgery is engaged in a variety of programmes of dental research which reflect our views on priorities and the availability of expertise and facilities in our School. These programmes, which receive selective allocation of funding, are connective tissue biochemistry, restorative dental materials, caries and plaque, salivary gland pathology, cell kinetics and epithelium-connective tissue interactions, ultrastructural studies of oral tissues and oral microbiology. The research is funded by research councils, DHSS, charitable bodies, industry and the University.

In respect of the specific questions,

(a) We have little evidence that priorities for dental research are actually set by any organisation. A coordinating dental committee with representatives from MRC, SERC and DHSS monitors proposals but as far as we are aware does not establish priorities that are communicated to the research community. There have been several reviews of dental research in recent years, but we are not aware yet of any coordinated *action* that has been taken to ensure dental research meets any particular set of priorities or perceived national needs.

(b)(c) There is no doubt that as the state of dental health is changing, so the priorities for research must change. There has been, for example, a move away from the direct funding of research into a vaccine against caries, and a move towards studies of the immunology of periodontal disease, the use of advanced technologies in restorative dentistry and the provision of dental treatment for the elderly.

(d) There is no public institution that has responsibility for the funding of dental research and we believe that this is a serious problem. Dental research comes under the purviews of the Medical Research Council and we believe it receives less than its fair share of funding, including the provision of research studentships. It is quite clear that MRC does not give dental research a high priority. The provision of funding by commercial bodies is of necessity biased towards the commercial products rather than basic dental science. Indeed, one might assume that a swing towards greater commercial sponsorship of dental research could well act against the interests of dental health if that research were aimed at maintaining a need for commercial products, especially in restorative dentistry, as opposed to the prevention of dental diseases.

(e) In general we believe the results of research are adequately disseminated.

(f) The peer review system for funded research work tends to prevent major duplication, although much unnecessary duplication must exist at a lower level.

(g) In general, yes.

(h) The provision of research studentships for dental research is woefully inadequate. Additionally, the recent restructuring of career pathways for hospital and academic dentists has made it very difficult for them to concentrate on research and obtaining the necessary training in research methods. More clinical research fellowhips are required.

(i) As noted above, we believe a separate Research Council dealing with Dentistry would allow a far more effective organisation of Dental Research in the United Kingdom.

I hope these views are of use to you.

Professor D F Williams

April 1987

Memorandum by the University of London, British Postgraduate Medical Federation

Involvement in Medical Research:

The BPMF, a federal school of the University of London, is the largest postgraduate medical school in the United Kingdom. The Federation's 95 professorial units are engaged in a wide ranging research programme extending from basic work in the biological and physical sciences to applied clinical studies. The close interaction between research and clinical practice is a feature of the BPMF. Of the eight postgraduate medical Institutes, seven are associated with Special Health Authorities and one with a Royal College:

Institute of Child Health	Hospital for Sick Children Great Ormond Steet
Institute of Cancer Research	Royal Marsden Hospital
Cardiothoracic Institute	Brompton Hospital, National Heart Hospital and London Chest Hospital
Institute of Dental Surgery	Eastman Dental Hospital
Hunterian Institute	Royal College of Surgeons
Institute of Neurology	The National Hospitals for Nervous Diseases, Queen's Square
Institute of Ophthalmology	Moorfields Eye Hospital
Institute of Psychiatry	Maudsley Hospital

The juxtaposition of this large body of medical research with the specialised clinical practices of the hospital presents an ideal milieu for the introduction of new developments into the clinic and the investigation of clinical problems in the laboratory. The research of the BPMF is broadly addressed at the major cause of morbidity and mortality; cancer, respiratory and heart disease, psychiatric illness, diseases of the nervous system and the spectrum of childhood illness. The Institute of Opthalmology is devoted to eye disease, a major problem in the developing world as well as the United Kingdom. The Institute of Dental Surgery is the only postgraduate school of its kind in the United Kingdom.

EVIDENCE ON THE NINE SPECIFIC QUESTIONS POSED BY THE SUB-COMMITTEE

(a) *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service or more generally the health needs of the nation?*

Nationally there are no generally accepted criteria or mechanisms for setting priorities in medical research although individual institutions, Research Councils or other grant funding bodies have to a variable extent developed their own strategies. The BPMF has established a small academic steering group to address the issues of forward planning and priorities.

Support for research is therefore influenced by numerous factors including; 1) the extent of the health problem in the community. 2) the attractiveness of any particular area of medicine to grant funding bodies. 3) existing patterns of medical research. 4) the identification of new problem areas. 5) developments in scientific methodology and understanding.

So far as the BPMF is concerned the research effort is directed towards common diseases including heart and lung disease, cancer, epilepsy, stroke, multiple sclerosis, Parkinson's disease, muscular dystrophy, dementia, the problems of old age psychiatry, mental handicap, alcoholism, smoking, drug addiction etc.

Heart disease, which accounts for over 50 per cent of deaths in the United Kindom each year is a major focus of research effect; fortunately the British Heart Foundation is able to support a large number of good research projects. Lung disease on the other hand, which accounts for more lost working days each year than any other type of illness, attracts less than 1 per cent of the research budget of the Medical Research Council and there is no major research support available equivalent to the British Heart Foundation. This is a matter of major concern to the Federation since research technology is available for rapid advances to be made in the understanding and treatment of pulmonary disease.

It is important that there should be a strong academic base in the field of *Child Health*. Research in children with, for example, congenital abnormalities, genetic disorders, infectious disease and neurological conditions, is ideally placed to shed light on human growth and development in its widest sense. Studies of the genetic and biochemical regulation of embryonic growth are complemented by enquiry into childrens acquisition of skills and adaptability. These are all areas of fundamental importance not only for Child Health but also for the establishment of the conditions necessary for adult health. This importance is not yet matched by the appropriate amount and quality of paediatric research in the United Kingdom. What slow progress there has been in the past is now being seriously threatened by the funding difficulties that undermine academic medicine.

In *Cancer Research* the basic work that has little immediacy of application tends not to reflect either the NHS or the national needs except in the general sense that cancer is a major health problem in all developed countries and in many poorer ones too. It is driven by the current ideas on the nature of cancer and by what is technically possible to investigate. This type of research is likely to have a major impact

on the NHS in 10–20 years' time. There is however a considerable body of work which has greater immediacy of application and this often mirrors closely the patterns of treatment of cancer in the NHS and the occurence of the disease in the community as a whole.

On a national basis *Dental Research* is considered by a combined MRC, SERC and DHSS sub-committee which helps to define targets for research activity within certain budget constraints. The most recent innovation was the initiation of a research unit at the London Hospital combined with the Department of Dental Science at the Hunterian Institute. Apart from this activity there has been insufficient national provision for the assessment of priorities for dental research. It was this sentiment amongst dental academics that led to the formation of Butterfield Committee in 1985 and which has since indicated the way ahead for dental research in the United Kingdom. One of its principle concerns was the lack of training opportunities and tenured career posts for dental research scientists in the United Kingdom at the present time. To a considerable extent applied dental research in the universities for many years has been determined by the requirements of industry and some of the larger research grants have been directed towards clinical testing and clinical trials to determine the efficiency of products, for example fluoride toothpaste. As far as clinical research is concerned it should be guided by an accurate appraisal of disease levels in the United Kingdom. This has been achieved to an extent by a series of national surveys of child and adult health undertaken by the social survey division of the Office of Population Censuses and Surveys with the assistance of university staff.

The Institute of Psychiatry's research priorities take account of 1) the stated priority care groups of the government 2) developments in the NHS, 3) social needs, 4) scientific advances. Priorities recently realised and others still in hand include: old age, psychiatry, mental handicap, alcoholism, smoking and addiction, development of basic neurosciences, psychiatric nursing, neurosurgery and mental health care evaluation.

In ophthalmology, research is reflected in improvement in patient care in larger centres. However, in the smaller centres, this is often not the case and in this day and age it is very difficult to defend ophthalmic centres in General Hospitals where the ophthalmic unit has less than six consultants. Many patients at Moorfields will have made five medical visits before their first visit to Moorfields: the GP, the Optician, back to the GP, to the local ophthalmic centre, to Moorfields.

Ophthalmology has become too technological a subject for smaller ophthalmic units to viable. In a country as small as ours with such good transportation it is better to travel a little further to receive the expert care.

As illustrated by the discrepancy between the level of funding for heart disease and lung disease, some areas attract support whereas other are less successful. Although the provision of funds for disease such as cancer and heart disease reflect an NHS and national need, other equally deserving areas of medicine may be relatively starved of funds.

The identification of new problem areas may exert an important influence on priorities for funding. The most obvious example is AIDS, a major endeavour in the Institute of Cancer Research but likely to become important in the Institute of Child Health and also the Institute of Neurology because of the central nervous system complications.

Developments in scientific methodology exert an important influence on the direction of research. For example the recent rapid developments in molecular biology have enormous significance for the study and treatment of many disease ranging from psychiatric and neurological illness to the study of vision and cancer research.

(b) *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back in order to allow those which should be given a higher priority to expand? What programmes need a priority? Would priorities change in the light of increased resources?*

There are major anomalies as indicated above, in the discrepancy between the funding for research in certain disease categories as opposed to others. There may also be difficulty in introducing new research methodology in the place of outmoded approaches. Today, basic research has become applied research and the challenge is to bridge the gap between rapidly evolving biological science on the one hand and increasingly complex and sophisticated clinical practice on the other. There is a need to strengthen the basic science support of medical research and to create a cadre of clinical scientists trained in both laboratory science and medicine who can provide the necessary bridge between science and the clinic. It would be extremely short-sighted in terms of financial stringency to cut back on basic research. In Cancer Research for example the programmes which need to be given high priority are those aiming at a greater understanding of the genetic basis of the disorder. In time the precise determination of the genetic material which is responsible for malignate conditions and the discovery of the relevent gene products will lead to more precise and effective ways of treating cancer.

So far as paediatrics is concerned there is disappointment in the development of paediatric research in the United Kingdom in recent decades. The main reason why development has been so unsatisfactory is

that the academic base is too small. When existing senior posts become vacant or new chairs are endowed there is often real anxiety about finding anyone in the country who is suitably qualified. The only sensible solution involves the creation of more junior academic posts and more core support for clinical academic departments.

The area of dental research that has received inadequate attention and funding in the past is that directed towards making prevention and treatment more effective and efficient.

It is suggested that a shift in this direction would be beneficial and the following areas are worthy of emphasis: epidemiological assessment of treatment patterns for dental disease, prevention and treatment of dental caries, periodontal disease and abnormalities of the teeth and jaws, prevention and treatment of oral pre-cancer and cancer, efficient maintenance of the dentition for the elderly whose numbers are increasing and many of whom are retaining their teeth into old age.

When a political decision is taken to promote research in a particular area this may be slow to translate itself into increased funding for research. An example was a decision to make the mentally ill, the mentally handicapped and the elderly, priority care groups. These areas need a higher priority than they are presently receiving.

(c) *Are priorities in medical research adapting to changing incidences of disease, changing population structures and new technology?*

There are several situations where priorities are not adapting to change. Asthma is one of the few diseases which is increasing in frequency and mortality especially in younger individuals is rising in many countries including the United Kingdom. Research support is lagging far behind. Belatedly there is a focus of research effort on AIDS and priority is now being given to research into senile dementia in recognition of the higher ratio of elderly people in the population and in part due to the remarkable developments in techniques for imaging the brain and progress in neurobiology. The adoption by many branches of medical research of the recent techniques of recombinant DNA, in order to define the molecular basis of a wide variety of diseases however does illustrate the speed with which the research fraternity can respond if the advances involved are sufficiently clear-cut.

In general medical research has adopted to changing disease incidence. For example twenty years ago stroke was not of interest to neurology, whereas polymyelitis was. The position is now reversed. Parkinsonism has undergone dramatic changes first with the introduction of steriotactic surgery which was later supplanted by L-dopa and more recently by dopaminergic agonists.

It is likely that changes in population structure, particularly the presence of our relatively new ethnic minorities have been insufficiently recognised so far as medical research (including social research) is concerned.

(d) *How are priorities in medical research influenced by the institutions for which research is funded? How does the balance between public, commercial and charitable funding of research effect the setting of priorities by the different Institutions involved?*

The priorities in medical research are influenced to a considerable extent by the funding source. So far as the BPMF is concerned the UGC grant derived through the University of London now accounts for approximately one-third of the financial support and two-thirds of the funding is derived from the Research Councils and charitable bodies. Whilst it is gratifying that the research funds generated by the Institutes has continued to increase, there is concern that the long term support provided by a recurrent grant from the University or an MRC programme grant is steadily being eroded encouraging research with short term objectives. In this situation it is important that the scrutiny of research projects within Institutions remains searching and well balanced. In general commercial funding sources are often of little use except in the penultimate stages of development of well defined inventions which are likely to lead to substantial profit in the near future. Funding from commercial sources to support basic science is uncommon. Trusts such as the Wellcome Trust, which have been rendered by the terms of their foundation independant of profitable return, serve and extremely useful function in supporting research.

Although dental disease is one of the most common afflictions in the United Kingdom it does not have the emotive appeal of some other disorders and hence funding from charitable sources is relatively difficult to obtain. This highlights the profound influence which sources of funding have on patterns of dental research. The joint DHSS/SERC/MRC committee which considers requests for funding for dental research has done much to influence the direction of projects. The role of Research Council coordinators in stimulating research and establishing inter-departmental links has been valuable.

(e) *Are the results of research adequately disseminated?*

So far as the scientific community is concerned information is disseminated through a voluminous literature and workshops, conferences etc. However, there is relatively little filtering of information into more publically available journals. The reporting of science in newspapers, for example, falls far behind the level at which it is undertaken for many other countries of the world, for example the United States

of America and Canada. Journals such as the; "New Scientist" and to a lesser extent "Nature" serve a useful function but tend again to be read only by members of the scientific community. It is important that the principle discoveries of science and the mode of thinking of scientists should become part of our culture to the same extent as the main works of art and literature. Considerable effort will however be required to achieve this aim. Similar strictures apply to radio and television.

(f) *How is unnecessary duplication of research effort avoided?*

Originality is promoted by peer review of grant applications and papers submitted for publication in scientific journals. In addition there is widespread communication between scientists by discussion at meetings, teaching seminars, international workshops and conferences. Important research findings, provided they are not kept confidential by commercial links, are disseminated rapidly. There is inevitably an element of duplication of effort which is healthy in that there are a few things in biomedical science which do not benefit from a combined approach and from careful and detailed confirmation. Even in apparently similar areas most major research teams are asking somewhat different questions or are approaching the problem from different angles. Their work therefore tends to be complimentary rather than duplication. Moreover, single major research findings must be confirmed by other groups to have any secure basis. Hence what appears to be duplication may infact be a crucial validation. Having said that it is also clear that a good deal of pedestrian and imitative research still goes on in this country. Financial stringency and the strategic planning of research programmes should minimise this risk in major institutions.

(g) *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

There are striking examples of remarkable improvements in medical treatment, areas of research which realistically promise to yield advances and medical conditions which are much more refractory and where there can be no certainty of success. Advances in recent years include the development of curative treatments for some forms of malignant disease, noteably paediatric cancer, lymphomas, testicular cancer and leukaemia as well as the noteable advances in organ transplantation. Other examples include the reduction in the incidence of stroke as well as its mortality and the improved management of epilepsy and myasthenia gravis. Research which promises to have a powerful impact on medicine includes molecular genetics, with the introduction of molecular probes for ante-natal diagnosis, and the promise of an understanding of the basic mechanisms that underlie a wide range of human disease processes. The establishment of career posts for clinical scientists to ensure the rapid translation of research findings into clinical practice would be an extremely important development. At present clinicians may spend two to three years in the laboratory, their research leading to a doctoral thesis, following which they then resume clinical practice. It is rare for them to be able to continue with a laboratory interest and inevitably their laboratory experience becomes outdated. The provision of a career track for research-trained clinicians who could spend a proportion of their time in the laboratory and a proportion in the clinic would, in the right setting, be extremely advantageous providing a bridge between basic science and clinical practice.

It is clear that some of the most innovative and imaginative research on basic aspects of disease may have little immediate benefit. Even when these are apparent "break throughs", for example the purification of leukotrienes as an inflammatory mediator in asthma, it is a long haul to identify antagonists to these mediators. Even when this has been done their role in the complex clinical syndrome of asthma may be disappointing as has been well demonstrated in the case of anti-histamines.

There is too little research on the practical aspects and delivery of health care and the actual prescribing practices of individual doctors even when desirable medical practices have been established.

(h) *What changes in priorities in the training of medical researchers are needed?*

In this country the majority of long term medical research workers are not medically trained. They are relatively poorly paid and we are losing far to high a proportion of our most talented medical scientistis to other western countries. The career structure for doctors is not good for those wishing to undertake research rather than clinical practice. This state of affairs is very different from that which prevails in, for example, most of the EEC countries other than Great Britain. It would be most advantageous to have a greater number of clinically trained personnel in medical research; this could only be done if the career structures in research and the clinic were comparable. Unfortunately the training of researchers has been seriously compromised by the near collapse of the academic career structure because of the multiple cut-backs from MRC, UGC, NHS (RAWP) and Manpower Re-allocation. As a result British academic medicine is in a serious state.

(i) *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

As shown clearly in the Medical Research Council's annual report the number of applications for clinical research projects has decreased as has the number funded. The number of individuals on grant committees and review boards who actually have patient responsibility are in a minority. Particularly serious is the failure of major longer term support so vitally necessary for research which must be conducted in the longer term into much chronic medical disease. The maintenace of research groups on a substantial scale

who can tackle some of the most common human diseases is almost non-existent. A major deficiency in medical research in the United Kingdom is of able recruits. The career prospects of medical research workers are dismal. In addition, the lack of long term posts and contraction of university and medical research resources have severely damaged the morale of the British medical research community. At the moment there are few good quality recruits available, most of them it seems going into better paid posts in the service industries; the problem is particularly acute in London owing to the high cost of living. Anything that could be done to improve this situation would be desirable. It must also be pointed out that the percentage of NHS expenditure devoted to research and development is pitiable.

M J Peckham

April 1987

Memorandum by the University of London, Charing Cross & Westminster Medical School

GENERAL

This response is on behalf of Charing Cross & Westminster Medical School, an undergraduate medical school of the University of London with Teachers in the Faculties of Medicine and Science.

The aim of the Medical School is "to achieve distinction in teaching, learning and research" within its areas of expertise, namely basic medical sciences and clinical sciences. The achievement of this aim implies a commitment to medical research at various levels and in close collaboration with the School's associated university hospitals (Charing Cross Hospital, Westminster Hospital, St Stephen's Hospital, West Middlesex University Hospital, Isleworth and Queen Mary's University Hospital, Roehampton).

Both Charing Cross Hospital and Westminster Hospital have Clinical Research Committees established under the provisions of the NHS Act and which provide research funds for clinical medical research.

Two independently established research centres have close links with the School, the Mathilda & Terence Kennedy Institute of Rheumatology and the Charing Cross Sunley Research Centre, and their comments have been incorporated in this response. Both conduct medical research and administer sizeable research grants.

RESPONSE TO THE SUB-COMMITTEE'S QUESTIONS

(a) *Priorities for medical research*

The Medical School sets its priorities for medical research:

(i) on the basis of its existing expertise and links with clinical centres of excellence within its associated university hospitals.

(ii) by the availability of funds from outside sources, for example the Research Councils, charitable funding bodies such as the Cancer Research Campaign, the British Heart Foundation, and British Diabetic Association, special funding through the NHS of priorities set by the Government and DHSS such as AIDS and mental illness services, and funding from commercial companies especially within the pharmaceutical industry.

However, the setting of priorities is at best limited as research proceeds at an unpredictable rate and new developments in one field may open the way to research in areas previously unthought of. This will affect priorities, as will the availability of outside funding for particular areas of research in a time of increasing financial stringency within the University and Health Service.

Emphasis on peer review for research grants and publications may have the effect of inhibiting research of an unconventional or controversial nature, notwithstanding the long-term results which such research might bring.

The needs of the National Health Service are only formalised through NHS funding of research into areas in which the DHSS or local Regional Health Authorities have expressed an interest, or through the national research councils making funds available for specific areas of interest developed in collaboration with the NHS.

Expressions of need by NHS Consultants within the School's associated hospitals may result in collaborative research projects at a local level as may personal links of staff with research groups throughout the Schools of the University of London.

(b) *Balance of research*

Definition of a "balance of research" within the School has led only to the conclusion that multi-disciplinary research should be given some priority for the School's UGC-funded research. This allows basic science research to be related to clinical problems and sharing of scarce resources. It would be difficult to obtain agreement throughout the School on any correct "balance", assuming even that there were national guidelines. Research into one area often has repercussions throughout several others and over long periods of time.

A decrease in resources would mean an overall decrease in research, as teaching and clinical commitments for academic staff remain relatively stable and research funding provides for the staff who carry out much of the routine work under the supervision of senior academic staff. An increase in resources might allow for more "speculative" research whose result might not become apparent in terms of clinical practice for some time.

(c) *Adaptation of priorities*

The increasing awareness of implications of diseases such as hepatitis or AIDS does change priorities in medical research, particularly when encouragement is given through increased availability of funds. New technologies are notoriously expensive in their early stages and the Medical School provides special facilities where new equipment may be assessed in controlled clinical environments. Scientific equipment which now allows routine laboratory tests to be done automatically has released staff time for work on other areas of research and patient care.

(d) *Influence of funding on research priorities*

With the reductions in UGC funding to Universities, the funding of research by outside bodies does have an effect upon research priorities—bearing in mind the research interests of staff and local expertise (see a (i) above). The School does to some extent control the acceptance of research grants in order to ensure that space resources are not over burdened and that the grant may be properly administered, but does not inhibit staff from seeking research funding from outside bodies

(e) *Dissemination of results*

The School actively encourages participation by its staff in the activities of professional bodies, attendances at national and international conferences and meetings, publication of papers, etc.

(f) *Unnecessary duplication of research*

Unnecessary duplication of research is largely avoided through the refereeing of grant applications by the grant-giving bodies and by informal agreements between individuals within particular fields of interest. Some duplication within any given field is seen as acceptable to provide independent checking of results.

(g) *Is research reflected in improvements in patient care*

Practical, usable results from medical research may take a long time to reach patients or to have a serious affect nationwide on patient care, depending upon the financial implications in any development. Local research may affect patients in a particular department long before techniques or machinery becomes widely available. At Charing Cross hospital the Research Committee established three Annual Clinical Fellowships over 20 years ago, and the link created between clinical and research work by young doctors is seen to have been translated into improvement in patient care.

(h) *Training of medical researchers*

One drawback in the training of medical researchers is the present lack of any career structure for basic scientists in medical research. Junior doctors face a rigidity of the career structure in most medical specialties which does not encourage taking time for research. The extra costs of research, and the increasing demands on time for teaching and clinical work creates a bias against research within some NHS institutions.

(i) *Changes to increase quality, quantity or application of research*

Application of new techniques or equipment arising out of medical research requires a flexibility by the NHS in funding such developments and this appears to be lacking in the present climate of overall reductions in expenditure on health services. Research activity will increase only when funding, facilities and encouragement to perform it are made more readily available.

University questions

1. *What has been the effect of the newly-introduced UGC funding policies on conduct and priorities in research?*

They have given an increasing emphasis to research, and publication of results.

The School has agreed a research policy, including the establishment of a Research Advisory Sub-Committee

(a) to identify and advise the Academic Board with recommendations where appropriate on
   1. long-term trends in research which should influence School policy;
   2. specific areas of promise which justify particular attention including links with other research establishments or industry;
   3. changes in central University or research council policies and other matters likely to have a significant effect on outside support for research;
   4. changes in the overall balance between teaching and research in the School;
   5. identification of multidisciplinary research groups which should receive any funds earmarked for research priorities;

(b) to provide advice to those members of staff requesting it on proposals for external funding of research;

(c) to advise on allocation of such funds as are referred to it;

(d) to report to the Academic Board not less than once a year;

(e) to consider other matters which might be referred to it.

Concern has been expressed that emphasis on research might be at the expense of teaching.

2. *Do you approve of the formula/principles underlying this funding?*

Qualified approval, but there is concern about inadequate recognition of the teaching role of university institutions.

3. (i) *Does the School/College have a policy on the exploitation of intellectual property?*

The new School has not yet discussed any such policy. The School is availing itself of the services provided by the Research Corporation Limited in this respect. Various charities funding research have their own guidelines which must be followed for research which they support.

(ii) *Is this formalized or informal?*

In process of being formalised.

(iii) *Does the institution have a committee/individual or other mechanism with a specific remit to seek out/encourage/exploit its intellectual property?*

No.

(iv) *Are there agreements on the proportional distribution of "profits" arising from the exploitation of "inventions"?*

No, agreed on an *ad hoc* basis.

(v) *Has there been any significant income from this source to date?*

No.

(vi) *Does the institution anticipate such income in the next five years, longer term?*

None foreseen at present.

4. *Does the School/College have a formal policy on priorities for research and if so how are these determined?*

Yes. Recommendations from the Academic Board to the School Council resulted in the establishment of the following recommendations, which are now kept under review by the Research Advisory Sub-Committee outlined in the answer to question 1 above:

(a) that the School should encourage the formation of multidisciplinary research groups; such groups not to be identified with one single individual's research interests; convened on a rotating basis by staff within the group.

(b) that the appointment of academic staff shared between departments within such groups should be encouraged.

(c) that multidisciplinary research groups should receive a proportion of the School's "hard money" resources.

5. *Does the School consider specifically the needs of the NHS in research in any formal/informal way?*

Informal—proximity of Hospital and overlapping of staff will mean that clinical research has direct relevance to problems encountered by school and hospital staff. There is cross-representation on both School and Hospital committees established to discuss research policies.

6. (i) *Does the District/Hospital have a research policy?*

The School's two main teaching hospitals (Charing Cross Hospital and Westminster Hospital) have Clinical Research Committees.

Riverside Health Authority has only recently been formed and as yet has no formal policy on research.

(ii) *Are any District (NHS) resources specifically devoted to research?*

Yes. The District funds academic developments in psychiatry, mental handicap and geriatrics, and participates in the activities of the joint School/District Department of Community Medicine. Research funding from the Regional Health Authority to the District funds research into AIDS under the current government initiatives.

(iii) *Are these resources part of "knock for knock" agreements/informal/formalised?*

Yes, in part, mostly informal.

(iv) *Are these arrangements satisfactory?*

Yes.

(v) *Are there significant contributions from the Special Trustees to academic/NHS research?*

Yes.

(vi) *Are there significant amounts of money contributing to medical research from whatever source, handled by the District/Special Trustees, which do not appear on School Form 3 returns?*

Yes.

(vii) *Are there areas in which the School would like to encourage NHS research?*

Yes; for example, (a) rehabilitation, (b) a search for infective agents in common disabling disorders in which the genetic component has already been identified, (c) schizophrenia research taking into account new developments in brain histology and the biochemistry of the brain, (d) psychotherapy research into disorders of personality. All of these are areas in which the NHS spend considerable resources in hospital and associated social services and which might benefit from structured research programmes.

7. *Does the region have a research policy? A research allocation? Any contribution to academic research?*

Yes. The North West Thames Regional Health Authority has a research policy and funds are allocated through its Regional Research Committee to both NHS and School staff in respect of clinical research.

Memorandum by the University of London, City and East London Confederation

(A) How are Priorities for Medical Research Set?

1. Priorities arise at different levels—in the plans of the researcher, or research team, and in the policy decisions of research funding agencies.

(i) *For the researcher*

The decision to pursue a particular line of research depends on many factors, principally past experience, the influence of the thinking of other scientists, the generation of a good idea, intellectual curiosity and (surprisingly frequently) the feeling that if the problem is solved, some benefit to humanity may be derived, either directly or indirectly.

(ii) *For the grant-giving bodies*

In the case of charities whose remit is to support research in a single field, the priority is already set; notwithstanding this, the grants committees of these bodies may perceive that a particular line of research is most likely to be fruitful. For more broadly based agencies—the MRC, Wellcome Trust, etc., the priorities are set by:

(a) the perceived opportunity for a breakthrough in a particular field, either because of an original idea, or because it is felt that the bringing together of several disciplinary approaches may be the key;

(b) the possible ultimate clinical benefits;

(c) in the case of the MRC, certain political pressures, generated by DHSS representations;

(d) for DHSS sponsored research, the support of the Policy Divisions, who are under political direction.

The problem about political pressures is that it is no good—and furthermore, a waste of resources—directing research funds to solve problems where there is a basic lack of good ideas and appropriate

technology and, sometimes, competent research workers. This was a major pitfall of the Rothschild consumer/contractor philosophy of research funding. For this and other reasons the Rothschild initiative proved unsuccessful and we *would strongly advise against an attempt to return to it.*

2. Such priority-setting as does occur should, for the above reasons, depend on opportunity for advance, rather than solely on perceptions of the burden of disease. Not infrequently, the two coincide, but we reiterate that to fund research in fields where there is human suffering, but little *current* prospect of advance (because of lack of new ideas and appropriate personnel) is a waste of resources. The history of medical science demonstrates that sudden breakthroughs or opportunities arise from improbable lines of research—it is better to wait till this happens. Thus the current priority given to AIDS research is very much justified, because there is both an urgent need for solutions to the problem *and* appropriate ideas and technology exist because of recent advances in virology, molecular and cell biology and immunology.

3. There is also another major problem arising from the interaction between research funding and political pressure. Because political pressures generally arise from short-term considerations, priorities arising from such sources seldom take into account the fundamental and essential role of basic research. The time scale of public accountability is too short for the ultimate fruits of basic research to be realised, and funding of basic research may thus be perceived to be non-productive to the public, most of whom are in no position to grasp in any detail how much of today's successes in Medicine were generated by basic research which was funded 10–30 years ago. However, the public may grasp the general argument that today's basic research is to ensure the better health of not so much themselves, but their children and grandchildren.

For these reasons, we recommend that whatever other priorities may or may not be set, *the support of basic research should always be a major priority.*

(B) and (D) Is the Current Balance Right? How are Priorities Influenced by the Source of Funding?

4. We comment on these two questions together because they are closely interrelated. Because public funding (MRC, DHSS) has been curtailed, a greater reliance for grants has had to be placed on the Charities and Industry (principally the pharmaceutical industry). With the principal exception of the Wellcome Trust, the Charities are disease or field specific. The funds at their disposal depend greatly on the emotive nature of their special interest and the success of their fund raising organisation. This results in a patchy distribution of fund availability, heart and cancer research doing particularly well, but many other deserving causes less well.

An important function of government funding should be to compensate for this uneven provision from private sources.

5. Research funding from the pharmaceutical industry is increasingly tied to product development. Pharmaceutical companies have had a major inflow of talent by recruitment from clinical academic staff in recent years, because of the very considerable problems of funding and career development that this group of research staff is now facing. Notwithstanding this major advantage to themselves, pharmaceutical companies appear increasingly unwilling to fund research in universities which, though of relevance to their interests, is not tied to a specific development. We believe this to be a short-sighted approach which is not in the long-term interests of the companies themselves.

6. We do not believe that an increase in resources would be likely to change *priorities*. As indicated in (2) and (3) above, other considerations should determine priorities.

(C) Adaptation of Priorities Changing Incidence of Disease, Population Structures and Technologies

7. In the case of dramatic illnesses such as AIDS there has been a rapid reorientation of priorities. The same cannot be said of response to changing incidence of more chronic but very disabling diseases. A good example is diabetes mellitus, the prevalence of which is about 2 per cent of the population and clearly growing in incidence. In some sections of the population (for example, Asian immigrants) about 10 per cent develop diabetes. This condition is a major cause of blindness, ischaemic heart disease and kidney failure and consumes large quantities of NHS resources. Recent developments in virology, immunology, molecular and cell biology present an obvious opportunity for the problem of diabetes to be successfully researched, but funding is poor, both on the private and MRC fronts.

8. Insufficient attention is given to the medical problems of immigrants and ethnic minorities. This is particularly evident in the field of psychiatric illness where the cultural barrier is much more difficult to overcome than the problem of language.

9. Priorities are unquestionably adapting to new technologies. The advent of new techniques may create the opportunity for major advances in a previously static field. As indicated earlier, priorities should largely be determined by opportunity. Furthermore, there is the growing realisation that a multi-technology

approach is frequently required, this being a major reason for the generation of research groups in which expertise of different types can be brought to bear upon one central problem.

(E) Dissemination of Research Results

10. Dissemination of research amongst scientists is well-developed. Precisely the opposite is true for making the public aware of the implications of health research. Therefore, more should be done to educate and inform about the progress being made.

(F) Unnecessary Duplication

11. We doubt whether this is as serious a problem as is often claimed. Some duplication is essential for confirmatory purposes. Furthermore, two superficially similar pieces of research are seldom truly identical unless they were deliberately designed so to be.

(G) Reflection of Research in Improvements in Patient Care or Education

12. The results of research are not adequately converted into improvements in patient care in this country, primarily because of service cost considerations. There are major problems in a resource-restricted service in perceiving what to drop so that innovations can be afforded. The slow introduction of CT scanners in this country and the even slower introduction of magnetic resonance techniques are good examples. Both these techniques were pioneered in this country. Introduction into service work is lagging well behind many other developed countries.

13. Research reflection in health education is even less satisfactory. We have not yet alighted upon the correct strategies for health education. It is possible that health education in schools is ineffective because courses on it are not examined. Such examinations are probably needed if health education is to be effective.

(H) What Changes in the Training Priorities of Medical Researchers are Needed?

14. There has been a welcome increase in the number of non-medically qualified scientists involved in medical research—a development of the utmost importance if new technologies and ideas are to be harnessed in the now almost universally essential multi-disciplinary approach to research. But clinically trained research workers are also essential to provide the interface between the patient, the patients' problems and the non-clinical scientists. It is well known that clinical academic units, the main source of these clinical research workers, have been under the most serious pressure in recent years because of financial cuts, both in the NHS and university spheres, and because of perceived rigidities in the training structures for NHS consultants which dissuade potential research workers from undertaking non-conventional training programmes essential to their development as research workers. A major priority in the training of research workers is therefore to find a sufficient number of research training posts—of several years duration—and to create career posts which clinically trained research workers may aim for, outside the usual pathway to NHS consultancy. Theoretically, clinical academic units ought to be able to fulfil this role. However, the time for research within these units which is necessary to be competitive has been disastrously eroded by the priorities of service and teaching as staffing levels in clinical academic units have fallen due to financial constraints. Structured pathways to a research career, with substantial though not complete protection from service and teaching commitments, need to be established, either in clinical academic units or closely related to them, if the skills of gifted researchers are to be used to the full.

15. There is also a clear need for training of more scientists, clinical and non-clinical, in the new technologies (molecular biology, cell biology, immunology and protein and membrane biochemists are the most obvious growing priorities). But recruitment will be very difficult unless the career pathways outlined in (14) are established.

(I) Should Organisation or Funding Changes be made in Research?

16. There is little doubt that medical research in universities has suffered in the past from spreading of resources over too many small departments, perpetuating research groups of insufficient substance to create the critical mass needed for research productivity today. There is evidence that some medical schools, including our own, are in the process of diverting their research funding to those relatively few fields in which they have shown especial strength.

17. There have been suggestions that it would be best to concentrate UGC research funding on to only a proportion of United Kingdom universities. We must emphasise that any such policy applied to medical schools would be disastrous for the education of the nation's doctors. Doctors are continually confronted throughout their career with the need to make critical choices between therapeutic options, including purported new advances, for their patients. They gain the necessary critical attitudes and expertise in evaluation of evidence from their training in an environment where research is in active progress and where the teaching staff, by virtue of their own involvement in research, inculcate such attitudes.

18. Notwithstanding this fundamental point, we believe there are clear opportunities for medical schools to reorganise their research in a way which would lead to better use of resources. The common organisation of medical schools is by Departments (often small in size) which have both a teaching and a research role, and are provided with a budget to support these roles. We believe that there are strong arguments for schools to choose to separate teaching and research funding. Schools would continue to support Departments for teaching purposes, but, *separately funded and managed*, there would be a number of Research Groups. The number of Research Groups in each school would be much less than the number of Teaching Departments. Most, if not all, of the academic staff of Teaching Departments would also be members of Research Groups. This arrangement would concentrate research effort into a much smaller number of fields than at present, allowing critical mass and funding to be achieved, whilst maintaining the research environment and ethos which is so essential.

Memorandum by University of London, Dental Schools

Introduction

The University of London has four undergraduate and one postgraduate dental schools. Research is regarded as an essential activity and is given a high priority and appropriate support within these dental schools. It has been directed at improving the prevention of dental disease, and where prevention is not possible, at improving treatment of dental disease.

There has been a sustained high level of research output from the schools and it was gratifying that as a result of the UGC assessment, one of the Schools, The London Hospital Medical College Dental School, received an "A" starred rating, one of only two dental schools to be so graded. The Dental School at UMDS was one of the three schools rated as above average. Much of the research is directly relevant to the NHS and is partly carried out in the dental hospitals associated with each of the dental schools.

The research is prosecuted mainly by UGC funded staff, their research assistants and students and to a lesser extent by NHS consultants and their junior staff. Dental research has been criticised in the past because it has not reached a comparable level with that in other subjects. It is claimed, with some justification, by the Butterfield Committee on Dental Research that "the output of dental research, other than that specifically concerned with the promotion of products, is small in absolute terms and relative to other biomedical fields". This is particularly true of clinical dentistry! There are problems particularly related to the nature and arrangements for teaching clinical dentistry that could explain this.

The House of Lords Sub-Committee has visited two of the Dental Schools in the University of London and were able to get some idea of the scope of dental research and some of the problems.

The Need for Scientifically Trained Dental Graduates

The clinical dental course is largely vocational in nature, since schools are required to produce a dentist on qualification who is capable of independent practice. The preclinical course is only one year in duration and, in common with the clinical course, is grossly overcrowded. Very few dental graduates intercalate at BSc degree because they are required to spend an extra two years on top of the four years and one term of the normal dental course. Medical students only have to do an additional year. The intercalated BSc course was highly regarded in the "Report of the Butterfield Committee on Dental Research" as a valuable means of attracting dental students to science. The Nuffield Enquiry into Dental Education recommended that the teaching of basic sciences to dental students should occupy not less than the equivalent of two years and be to a standard no lower than that appropriate for medical students.

Moves are under way in the University of London to allow dental students to intercalate a BSc in one year after completing the first two years of the BDS course. However, it is generally held that this can only be done effectively, if the dental course is extended to five years, as has been recommended by the dental profession and the General Dental Council. The University of London has accepted the need to extend the dental course to five years on educational grounds but funding the students for an extra six months presents a big obstacle to its introduction.

In a five year course it will be possible for the more able students to join in with established research teams or undertake their own research. A few do this at the moment but the majority are inhibited from doing so by their heavy clinical teaching load in the overcrowded course. Such an extension would encourage a more scientific approach to dental education.

Financing Intercalated BSc Students and Students taking Postgraduate Research Degrees and Conducting Postdoctoral Research

In common with other University disciplines a major disincentive to students intercalating BSc's, taking MSc or PhD degrees or continuing with postdoctoral research is the problem of financing it. For many able students the cost is prohibitive and dental schools are not in a position to fund such education from

their own resources. If more students are to be encouraged to receive training in research then central funds will be needed to support them.

Staffing Problems in the Dental Schools

A low staff:student ratio is needed for clinical dentistry to protect patients being treated by students. This may vary from 1:1 for surgical procedures for 1:8 for simple conservative work. On average a ratio of 1:5 or 6 is considered to be desirable. In consequence dental academics have always spent much more time in direct clinical chairside teaching and supervision, at the expense of their research time, than any other University discipline. The recent cuts in staffing have compounded the problem, since clinical teaching and NHS service commitments have, of necessity, been given priority. Many full-time teachers have as little as a day a week to devote to research. In addition junior staff are required to follow similar training programmes to their NHS counterparts to become accredited and thus be eligible for appointment to honorary consultant status. This leaves very little time for formal training in research methods and seriously erodes the time for research in what should be one of the most productive periods of their careers.

The number of senior academic posts has been reduced due to diminished Central Government funding, by freezing of posts on the retirement or redundancy of the incumbent. This has disrupted established research in some schools and, in addition, it has proved difficult to recruit new academic staff to London because of the "London Factor" of house prices, cost of living etc. For example, there are two vacant chairs in Orthodontics in the University which cannot be filled although there are suitable candidates outside London. Perhaps a more realistic London Weighting and similar help with removal expenses etc. to that given to NHS Consultant Staff might mitigate this undoubted problem.

Funding of Dental Research

In relation to the total national expenditure on the provision of dental treatment services, only a very small amount of government funding is allocated to dental research. Since much dental disease is preventable, it would be logical to divert more resources into dental research to reduce the need for and improve the efficiency of treatment. If the research output is to be increased there is clearly a need to increase the amount of support available. This is particularly relevant at present when both universities and health authorities are under enormous pressures to economise and have insufficient resources to meet all their current obligations. In such circumstances it is hardly surprising that research funding from these sources suffers.

In the past much of the work carried out in the University of London Dental Schools has been supported by the MRC and SERC, but it is clear that competition for such research council grants is becoming ever more intense. Purely clinically orientated research, of the type that is of direct relevance to the NHS, attracts very little support from the MRC or SERC where basic scientific investigations are favoured. The DHSS and charitable trusts such as the Wellcome Trust have also supported dental research and grants have been obtained locally from the Regional Health Authorities and the Special Trustees and other endowment funds of Hospitals and Schools. Commercial companies continue to be an important additional source of research funding, although such support is often related to the evalution or development of particular products or materials rather than to more fundamental investigations. Attracting external funding from industry in general has always been difficult. Dentistry is not a subject that readily catches the imagination of big business, especially when there is direct competition with medicine. The dental manufacturing industry has declined over recent years in this country. At one time Britain led the world but there is now no major company producing dental equipment that can compete with manufacturers in Germany, America, Italy or Japan. In consequence there is little or no research or development being carried out into dental equipment, and financial support for dental research from the dental industry is poor except for those companies producing health care products such as toothpaste.

A particular problem with funding projects from non-UGC sources is the short time period of such grants. They are rarely given for periods longer than three years and it is difficult to carry out the long term studies that are necessary for chronic diseases such as dental caries and periodontal disease.

The insecurity of tenure of research workers makes it difficult to keep teams of workers together for long periods. The Research Councils need to fund much longer term research projects in University Dental Schools to overcome these problems.

Dental Research in the University of London

The facilities and expertise for carrying out dental research are good in the dental schools of the University of London. Staff in all departments within the clinical dental schools as well as colleagues in the Basic Science Departments, are involved in dental research. Each school has its strengths and there is much cooperation between them with collaborative research. There is very little duplication of effort.

Priorities are determined by the schools but much of the research work carried out is directly relevant to clinical practice. Their Lordships have been able to see for themselves the facilities and the ranges of projects being carried out at University College and Middlesex School of Dentistry and United Medical and Dentist Schools of Guy's and St Thomas's Hospitals. There are also very well-found research

laboratories and facilities at King's College London, the London Hospital Medical College Dental School, and the Institute of Dental Surgery and many of the departments in our schools have established international reputations.

In 1984 the MRC Dental Research Unit was established at the London Hospital Medical College and staff from several departments are collaborating with that Unit's Periodontal Disease research programme.

In recent years research has been strengthened by the appointment of new Lecturers under the "New Blood" scheme of the UGC and the "Academic Initiative" scheme of the University. These have proved invaluable in opening up new areas of research and it is hoped that these or similar schemes will be continued in future years.

SUMMARY AND CONCLUSIONS

1. Research in dentistry is essential for continuing improvements in our knowledge of dental and oral diseases and their management, and for the vitality and long-term development of dental schools as effective academic institutions.

2. A wide range of dental research activity already exists in the dental schools incorporating many different scientific disciplines. Periodontal diseases represent one major area where intensive research effort is indicated, but many other important subjects are worthy of attention.

These include:

- dental care of the elderly;
- dental problems and management of handicapped and medically-compromised patients;
- dental caries in high-risk population groups;
- development of new dental materials;
- clinical measurement in dentistry;
- oral cancer and other oral soft tissue disorders;
- oral microbial ecology and oral infections;
- growth and developmental disorders;
- genetic basis of oral diseases;
- behavioural aspecs of dentistry;
- cross-infection control in dentistry.

3. Provision of adequate funding for dental research is a problem and increased expenditure will be required for significant progress to be made in the future.

4. The importance of research should be emphasised in both undergraduate and postgraduate dental teaching. Time within an extended curriculum and facilities should be provided for student research projects.

Letter from the University of London, Joint Academic Department of Child Health

I am Head of the Joint Department of Child Health at the Medical Colleges of St Bartholomew and the London Hospital. The Department has research interests in neonatal medicine, physiology, immunology, gastroenterology (Prof Walker-Smith), Epidemiology (with Prof Alberman), pharmacokinetics and community child health. The Joint Department was founded to weld together the resources of the schools and was situated at the Queen Elizabeth Hospital in East London, where the majority of the child patients are cared for. My replies to the committee's questions relate in part to my Department's particular experience, its aims, successes and failures and also to my observations of the national position in Child Health and paediatrics. They are also framed against the concept that paediatrics and child health are young branches of medicine which have not yet fully answered the research needs of children nor fulfilled their research promise to the academic community, although a valuable start has been made.

(a) Apart from a general scientific and clinical curiosity and a desire to give better service, there are no overall strategies for determining the priorities for paediatric and child health research. The scientific programme at the annual 4 day conference of the British Paediatric Association and the constituent groups tends to act as an informal college through which ideas and priorities emerge. Members of the BPA relate their work there to the perceived needs of the Nation and the NHS.

2. It is not possible to be certain that the balance between different branches is correct. Research funds are so restricted that few broad comprehensive programmes are going forward. A patchwork of disorganised

opportunities governs what happens. Most branches are grossly underfunded and I can think of none that should be cut back.

(c) Yes.

(d) Local priorities are influenced by skills present in each of the University Departments of Child Health, and parallel NHS departments and their perception of the localities or Regional or national need. Public funding is inadequate, commercial funding is full of pit-falls and charitable funding very chancy. Thus the priorities in each department are largely set by the balance of these essentially accidental factors. Heads of Departments are quite likely to be busy with clinical and teaching duties and may find it dificult to influence these chance factors.

(e) Yes.

(f) In paediatric and child health research in this country, resources are limited so that duplication is not really a risk—it's the gaps, not the overlaps that cause concern.

(g) It is reflected in improvements in health care as soon as possible. Health education is a much slower process.

(h) Most University Clinical Child Health Departments attempt to offer research training but few can provide a comprehensive strategy of training. Good inter-departmental relationships on the campus help. The medical career structure and shortage of consultant jobs makes it difficult to encourage a young clinician to spend more than a year in research even if the funding is available.

(i) Clinical academic child health departments are in general overworked and compelled to fulfil a plurality of roles in teaching, clinical care and research with very small resources of personnel and running costs. They must however, remain independent of other branches of medicine so that the special needs of children are met. The public interest would be served if many were doubled in staff numbers and running costs increased several times. The hard money basis is very small and basic expansion is needed if an entreprenurial role, is to be achieved and with this a rapid expansion in acquisition of other funds.

C B S Wood

May 1987

Memorandum by the University of London, Joint Medical Advisory Commitee

1. We welcome the opportunity to respond to this important enquiry. This document originates in discussions by a small working party and the executive of the JMAC which is the representative body for the University on medical and dental matters relating to the Schools and NHS. Our remarks refer primarily to medical research but are intended appropriately to embrace dentistry. Several Schools of the University have opted to present their own documents, which supplement this University response.

2. Although the particular concern of the Sub-Committee is research in the NHS, the second paragraph of the Clerk's letter rightly encourages a wider response. We have accepted that invitation.

3. This document refers primarily to the funding and influence of various factors on the research carried out in the medical and dental schools and faculties of the University and bio-medical research undertaken in association with them. Medical research is taken to include all research which directly or indirectly is intended to contribute to patient care, immediately and in the longer term. It therefore includes the elucidation of clinical problems, the process of disease and of the biological framework within which these disease processes operate—the essential background without which clinical problems cannot be resolved.

4. It should be stressed that discussions on medical research depend on definitions. Research is a continous spectrum; for example, advances in X-Ray crystallography were a key factor in determining the structure of DNA and the unravelling of the genetic code which in turn led to the development of molecular biology and genetic engineering now at the centre of the most exciting and productive developments in medicine. The determination of the chromosomal abnormality in cystic fibrosis for example now offers an opportunity for clinical intervention in this distressing and quite widespread condition. Where in this spectrum should medical research be deemed to have begun?

5. It is convenient to refer to basic, conceptual or fundamental research, which is concerned with the development of mechanisms, is largely laboratory based and expensive, speculative, unpredictable and not easily planned, as one end of a spectrum, and at the other, pragmatic, applied evaluative research which is practical in intent with immediate outcomes relevant to patient care and which in essence can be the subject of contract funding. Clinical research which used to be predominantly applied, now increasingly involves basic research. Health services research which is concerned primarily with the administrative

delivery of health care and can conveniently be considered separately, is nonetheless dependent on the outcomes of clinical research, a point which is often forgotten.

6. Artificial boundaries in the continuum of medical research are frequently a major conceptual problem for both the NHS and the Department of Education and Science (DES) and create funding anomalies and inefficient use of resources. The demarcations in the funding of university hospitals and their associated medical schools between the DES and NHS are a prime example. The Croham Report "Review of the University Grants Committee" puts the case well (Paragraph 6.30) and the press release of the Joint Note of Guidance by the DES and the Health Departments of 26 March 1987 on medical education is a timely and very welcome expression of cooperative intent. We hope that it is implemented and includes research within its purview.

7. The protean nature of medical research need hardly be emphasised. It is carried out in medical and non-medical schools of the universities, research institutes, hospitals and industry and has widely diverse funding. However, medical research is not quite so uncoordinated as it might at first appear: there is communication between the Medical Research Council (MRC) and the major United Kingdom medical charity, the Wellcome Trust, and the recent formation of the Association of Medical Research Charities with thirty-four members is an important development. Moreover, the medical research community is a relatively tightly-knit group and there are numerous conferences, societies and journals devoted to the dissemination of information both within and across disciplines. The system of peer review of grant proposals and published work provides an important element of communication as well as quality control. In London, intercollegiate activity of the federal University ensures that strong links are maintained between research groups. In practice these arrangements work extremely well and we would consel extreme caution in adding additional planning mechanisms to them. The history of research is littered with the funding blunders of well-intentioned committees whose members are not actively engaged in research.

8. Science depends on the prescience of individuals and there has always been a strong and quite proper tendency to build around outstanding personalities. Modern biomedical research, in common with other high technology research, frequently depends on expensive equipment and team skills. This conceptual framework has become the basis of University Grants Committee (UGC) funding policy. We would wish, however, to inject a cautionary note about this persuasive generalisation—research advice after all tends to come from interested parties. There is still a need to allow individuals and small groups to plough their own furrows with relative independence. True innovation will be stifled without this freedom. Einstein worked alone, Watson and Crick were a team of two. With modern communications individual and team initiatives are entirely compatible, no one works in isolation.

9. Basic medical research is primarily funded by public monies through the UGC dual funding arrangements and the MRC. Some medical charities, however, increasingly recognise the importance of basic research in meeting their specific objectives, a very welcome shift in attitude. Pragmatic research is funded to a greater extent by the pharmaceutical and other industries, the NHS, the medical charities, bequests and endowments and private resources, but with inevitable overlap from other public money resources. Overall, we would estimate that considerably more resources, both money and manpower, are devoted to this sector than to basic research.

10. Research should not be seen as an isolated element in the health care of the nation. Its products and techniques directly contribute to the management and understanding of health and disease, it makes a major contribution towards training and education, inculcates a critical attitude across the service and ensures a positive and up-to-date atmosphere to patient care. In a minor but significant way the number of staff involved in patient care incidental to clinical research is increased. Failure to achieve the right balance puts intellectual morale, and therefore the intellectual capital of medical research at risk.

11. The training element not only includes the young scientists of the future (both non-clinical and clinical), but also those young clinicians who, as an important and necessary part of their training, spend only a short period—a year or two—in research. Such research exposure is a formal requirement of most higher medical training programmes of the Royal Colleges. Training in research is of course the key element in the development of academic medicine and in the rapidly evolving science base of medicine which has burgeoned in the last few decades. Well-found clinical academic departments are an essential element in this process and sound research is reflected in the quality of clinical care. The medical schools of the University of London have and continue to take the view that teaching and research are inseparable. It is of interest that the current strong trend to integration between the basic and clinical sciences in medical curricula is having a quite marked effect on integrating research activity on similar lines.

12. Nationally, the universities through their medical schools and faculties and associated institutes are the main providers of medical research. The dual-support system which is the basis of the funding process, by the DES via the UGC and MRC, and academic medicine itself, are currently under threat by attrition. A career in academic medicine is becoming increasingly unattractive, and recruitment correspondingly difficult. The main features are:

(i) the substantial decline in UGC grant (−19 per cent on average) with a subsequent loss of 16 per cent of UGC funded clinical staff in the last five years (12½ per cent of all staff)

(ii) The MRC grant has failed to keep pace with inflation, exchange rates and salaries. The MRC is the major funding source for medical research and its grant in 1985–86 has fallen by £2 million allowing for inflation, from £101 million in 1981–82. The actual value is less because of the effects of adverse exchange rates and salary increments, amongst other factors. On reflection, it is extraordinary that the major medical research funding body in the country should have to rate proposed projects alpha and then not fund them—a process repeated in the other Research Councils.

(iii) Teaching and research have likewise been severely eroded by cuts in NHS acute services, mainly due to the shift to community and newly-identified priority care groups and increased patient throughput. The heavier service load on academic staff always takes priority and there are additional administrative functions in maintaining services in straitened circumstances. The customary half time service load of academics is estimated to be nearer three-quarters in practice. The workload for clinical academics is disproportionately far greater than that of their NHS colleagues. These effects are accentuated in London because of the additional factor of regional and national redistribution policies advocated by the Resource Allocation Working Party (1976)—RAWP.

(iv) There has been some success in encouraging charitable funding (up to 65 per cent since 1981) and NHS support for academic posts. Clinical service requirements however remain the main determinants of new or replacement clinical academic appointments by the NHS (clinical academics require honorary NHS appointments). These service priorities can conflict with academic research needs. There are converse situations where the loss of a clinical academic has resulted in several service deficiencies. London has inevitably done less well by way of NHS support because of the RAWP factor referred to above.

(v) Retrenchment is now a major preoccupation of senior academics. For example, under-funding of clinical departments has put increased pressure on senior staff to seek supplementary income from private consultations. This has several immediate effects: increased cllinical load, distortion of priorities, concealment of the true under-funding position and, at a more subtle level, discouragement of the more difficult formal grant applications to the detriment of a school's research income. Imbalance between the funding of departments occurs because the obstetrical and gynaecological, medical, and surgical specialties gain income in this way much more readily than other areas such as psychiatry.

(vi) The conditions of service of clinical academic staff compare unfavourably with those of their NHS colleagues. For example, removal expenses and housing loans are more readily available to the latter. Disputes over assumed pay parity have a corrosive influence although we take some late comfort from the recent general assurance on this matter from the Secretary of State for Education.

(vii) the substantial reductions in junior staffing levels under proposed new manpower arrangements fail to take adequately into account the needs of academic medicine in competition with service requirements. The effects of the present Joint Planning Advisory Committee (JPAC) recommendations on senior registrars which follow RAWP precepts will be punitive on some London medical schools with cuts amounting to 40 per cent in general medicine and surgery.

(viii) As already stated, conferences and peer debate are an important part of research. Travel abroad to present papers and lectures at international conferences is increasingly difficult and the experience is depressing—the differences in funding between ourselves and the other developed countries is all too obvious. The contributions of United Kingdom scientists, which are still of a high calibre, are declining. (The imposition of a publication page cost, particularly in American journals, will have a marked effect on our presence in some important international journals.)

13. The University of London is a major contributor to medical research through its ten (soon to be nine) undergraduate medical and dental schools and eleven (shortly to be eight) postgraduate institutes of the British Postgraduate Medical Federation, the Royal Postgraduate Medical Schools, the School of Hygiene and Tropical Medicine, the School of Pharmacy, and through departments of biology, biochemistry, pharmacy, sociology, psychology, nutrition, biomedical engineering and physics in its multi-faculty schools. It is not possible to extract the figures for the total expenditure on medical research within the University since much of it is inextricably linked with other research activity.

For the same reason it is difficult to obtain figures for the total spending on medical research in the United Kingdom. The following figures are, however, indicative of the relationship between UGC Form 3 research returns and UGC funding of *clinical* medicine in the University of London for 1984–85:

Clinical Schools	*UGC expenditure (student based)*	*Form 3 Research expenditure*	*% Form 3/UGC*
Undergraduate	£24.2m	£24.0m	99.8%
Postgraduate	£14.2m	£20.3m	142.7%
Total	£38.4m	£44.3m	115.5%

It should be borne in mind that these figures do not include sums from numerous other sources, such as bequests, endowments, private funds and monies handled by Hospital Special Trustees. These sources cover most of clinical contract research (clinical trials). We estimate that these figures more than double the returns. Treated as a return on investment these sums are impressive.

14. The NHS is not geared to the total spectrum of medical research and funds developmental and health services research predominantly with little contribution to clinical research. Although it spends quite large absolute amounts, in terms of overall NHS funding, research is a pauper. Official returns show a figure of £28.1 million for 1984–85 (£28.2 million in 1981–82) in a budget of over £3 billion. The Department will no doubt provide details as to how this is deployed. The 14 Regions have small research budgets, in the order of £0.3 million to £0.5 million in budgets of about £1,000 million, or about 0.05 per cent. The amounts and distribution policies vary but funds are generally available to all categories of staff for small pragmatic projects. While the sums available are tokens in budgetary terms, they do fund individuals and projects which in other circumstances would never be supported. They also serve to keep alive in the NHS the concept that research might be important. As far as we can determine, no London Districts have formal research budgets or allocations, and are inevitably almost entirely service oriented. Most teaching districts do, however, fund academic appointments in support of service commitments which have some research links. The teaching districts are also involved in the complex "knock for knock" arrangements with their medical schools. The Service Increment for Teaching (SIFT) plays no formal part in research funding.

15. Retrenchment has lent impetus to the commercial development of intellectual property. Several London schools have taken out patents and are exploring this source of revenue. It is of passing interest that there seems to be more support from foreign-based rather than United Kingdom companies for these developments. The potential may be very large but at this time no medical or dental school has received any useful return. The restriction on free publication of results which this practice implies is generally alien to the medical ethic.

16. In a more general vein, the pressure to increase income from commercialisation to bolster revenue deficiencies is having some effect on the internal distribution of resources away from research which has little prospect of commercial gain. All Deans are alive to this risk but the pressures are very difficult to resist when viability is at stake.

17. The United Kingdom has a particularly well developed expertise in clinical trials which the pharmaceutical industry funds. This is an important source of income for clinical academic departments but generally does little to further the academic interests of these departments and indeed may even be counter-productive. There is evidence however that pharmaceutical companies are no longer as enthusiastic about United Kingdom based clinical trials as they were and there has been a shift to other European countries. Part of the explanation for this lies in the increased service load of academics who no longer have the time to devote to the proper mounting of their trials.

WE RESPOND BELOW TO THE NINE SPECIFIC QUESTIONS.

18.1 (a) *Setting priorities. The needs of the NHS and the nation*

18.1.1 Priorities are in general set by the availability of funding and the intentions of the grant giving bodies. However, the circumstances are not in vacuo: there is a continual feedback of the research talent available by personal contact and peer review monitoring of grant applications.

18.1.2 In a discussion on setting priorities in basic research, the particular case of AIDS is instructive. Ample funds have been made available and the take-up with high class projects has been immediate. There is a good prospect of success. When other priorities have been set by the MRC, for example in mental handicap, the response has not been so dramatic. Why the difference? We would adduce several factors: the availability of a substantial background expertise in molecular biology in which much of the research is founded, the intellectual stimulus and profound consequences which will derive from the understanding of this particular virus and, certainly not to be undervalued, the publicity and emotive content, kudos, and the availability of a potential research bonanza. Priorities work in context, like seed in fertile soil. Resources without the science base are like seeds sown in a barren field—hence the over-riding need to protect this research base.

18.1.3 Throughout this document we have placed an emphasis on the need to recognise the continuum of research from basic to applied science in the development of medicine for the benefit of patient care. The point of input for the NHS is the clinical academic department. It is at the sharp end of clinical practice and consequently is in the best position to determine priorities in its sphere of interest and with a knowledge of the personnel available. The presence of an academic department creates a significant priority in the subject.

18.1.4 The medical charities with specific aims set specific priorities. They represent a distortion of priorities which is inevitable. Many charities are devoted specifically to particular diseases or organ systems and as such reflect the entrepreneurial enterprise of interested individuals or groups. Less appealing subjects do not get funded well—or at all—and there is still less support for the general background of science and cross-boundary developments. The Wellcome Trust is a notable exception and the MRC is exemplary in this respect.

18.1.5 It is often remarked that the health of the nation has more to gain from changes in social policy than from medicine itself, and that the Health Service is really a service for disease. These are half truths. The right social and health policies derive from an understanding of the diseases they are designed to circumvent. Unfortunately there is no short cut to the goal.

18.2 (b) *Balance*

18.2.1 We believe the present balance of medical research is about right, or as good as any other. Given limited resources we cannot really suggest useful change. Increased funding can change priorities within limits. Creation of academic departments will significantly affect research in that field, for example in mental handicap. Public funding to meet gaps in medical charity and pharmaceutical programmes needs to be encouraged.

18.3 (c) *Adaptation*

18.3.1 We believe yes, natural adaptations occur. But vide 18.2.1: new priorities need new resources. The real problem with medicine is that it is continually expanding and successes inevitably increase commitments and expectations. Few conditions are ever eliminated as service loads: in infectious diseases for example, only smallpox has ceased to be a problem.

18.4 (d) *Influence of institutions, public, and commercial and charitable funding*

18.4.1 The priorities of funding bodies affect research markedly by the simple fact of the availability of funds. In the case of pragmatic contract and applied research they *determine* priorities. In straitened circumstances, recipient institutions are much more likely to yield to these predetermined priorities; bluntly to go for "the fast buck" rather than pursue sounder but longer term and less immediately rewarding policies. Fundamental research is thereby impoverished.

18.5 (e) *Dissemination*

18.5.1 This is not a problem. Medicine has more journals, papers, newsletters, conferences and meetings than any other discipline. It could be argued that the "noise" level, the sheer weight of information, is too high.

18.6 (f) *Duplication*

18.6.1 We do not believe that there is significant duplication of research effort. Communications through journals, conferences and meetings and peer reviews already mentioned, suffice to prevent this fault.

18.7 (g) *Research and improvements in health care*

18.7.1 There is always a degree of inertia. Significant medical advances, however, are very rapidly taken up. Some important consequences of research, as for example the Black Report, may be lost for political reasons or administrative inertia. Health education is underfunded and has a regrettable tendency to follow the "flavour of the month".

18.8 (h) *Priorities in training for medical research*

18.8.1 We believe the most important single factor is the creation of a stable and satisfactory career structure. Short term commitments are not a satisfactory means of ensuring a cadre of properly trained research workers. On the clinical side the failure of the DES to come to grips with the funding of the intercalated BSc has been disappointing. The Joint Committees on Higher Medical Training (JCHMT) of the Royal Colleges, partly in response to the imperatives of manpower control, have tightened training programmes for future specialists with a premium on service training and a downgrading of research elements. (Some do not recognise a research component). This process will have a very serious effect on academic medicine which will become increasingly unattractive and stifle interchange between NHS and academic careers. This is, we believe, a very serious matter for the vitality of medicine in the United Kingdom.

18.9 (i) *Changes in organisation*

18.9.1 We believe that the most important need in the present system of research funding is dependable basic funding from public monies. Charitable and commercial interests, welcome though they are, perturb priorities and over dependence on these resources in the absence of reliable basic funding can be expected to, and does unbalance medical research. Within a stable backdrop, however, these imbalances can be managed effectively at School or institutional level with immense gain to the system as a whole. The recent UGC initiative regarding the development of formal academic plans has been a very fruitful exercise in causing institutions to examine and coordinate their research endeavours in a fundamental way. We are accordingly absolutely opposed to the creation of any new large central funding agency or directive.

19. General Remarks

19.1 Medical research is in a depressed state. Fundamentally the reasons relate to reduced funding, in the NHS, the UGC, and the MRC. The NHS has never been committed to research and has never really grasped the central role of research in health care, notwithstanding the injunction of the Medical Act which recognised the importance of research for the service. The demarcation boundary between the Department of Health and Social Security and the DES has permitted each to shrug off responsibility on the other. For the DES, the UGC and ultimately the Universities struggling with reduced resources, medicine appears as a veritable black hole, absorbing everything it can get and seemingly never fillable. Although there has been no change in undergraduate student numbers, medicine has been cut along with all the other University disciplines.

19.2 The dominance of service demands has been a recurring theme in this document. The Stoker Committee highlighted the same problem. We welcome the Stoker initiative and look forward to the establishment of at least one properly funded clinical research facility in the United Kingdom. We welcome too the consideration that the Sub-Committee has given to this subject and trust that the outcome of its deliberations will result in real progress in the resuscitation of what used to be a source of national pride.

19.3 Members of the University would be pleased to attend on the Committee to provide oral evidence should the Committee so wish.

Memorandum by the University of London, King's College, Nursing Research Unit

Introduction

The Unit is responsible for a programme of research related to various aspects of the education of nurses and midwives and the roles they fulfil in health care. It was established in 1977 and is funded almost wholly by the DHSS. At present the Unit's establishment comprises a Director (part-time), three Core Staff who provide continuity together with a range of research skills and expertise, and Research Assistants attached to projects. Members of staff have widely differing backgrounds including nursing, social sciences and statistics. The Unit is part of the King's College Department of Nursing Studies which is the only nursing department in London University and has a BSc and MSc in Nursing as its core, plus an increasing number of PHhil and PhD students.

August 1985 saw the amalgamation of Chelsea College with King's and Queen Elizabeth Colleges, an event which not only formed part of the London University rationalisation plan but offered real structural and academic advantages to NRU. Predominant among these is the presence on the Chelsea Campus of the Centre for Educational Studies (CES) with which NRU has a natural affinity in research issues and methods.

Research Programme

Much of professional education is complex and poorly documented in all its elements. Nursing education may be said to have a number of sequential strands: the initial development of practical and cognitive skills, assimilation of knowledge of practice related to these skills and the ability to analyse, quesion, reflect upon and learn throughout a professional career. Hence, education in nursing is a life-long activity and the NRU programme of work increasingly reflects this belief, ranging as it does from initial preparation to continuing education. Unit work has also examined the extent to which nurses and midwives are able to fulfil the roles for which they are trained, and the factors which encourage them to remain in the profession as well as those which contribute to a decision to leave. Furthermore, the Unit's work now encompasses the three main strands of general nursing, midwifery and psychiatric nursing.

Already NRU has a substantial data-base which allows for linkage between projects, for example both the Ward Sister and Clinical Learning projects have information on the views of ward sisters, thus allowing comparison, supplementation and cross-validation of data from individual projects. As this process develops, it will facilitate the progress of new work placed with the Unit; in many areas of nursing therefore it would not be necessary to start from scratch thus effecting savings in lead-time and costs. Unit staff believe this to be a strong argument for the funding of units, as opposed to single projects (though an

ideal world would possess both) and any analysis of research in nursing education and practice to date would reveal the shortcomings of a piecemeal approach. NRU staff therefore take the phrase "a programme of work" in the unit contract with the utmost seriousness.

Identification of research topics and subsequent funding is based firmly on the "customer-contractor" principle enunciated by the Rothschild Report (Cmd 4814). This process allows for discussion at all stages of the research, via the DHSS Research Management Division and, for this primary purpose, the satisfaction of customer requirements is paramount. For results to be reliable and valid, however, research must be sound in method and, to ensure this, periodic peer-group review has occurred involving visits by the DHSS Chief Scientist and team. Additionally there are the needs of the profession, with whom reciprocity must be maintained if the goodwill of individuals, organisations and groups is to be forthcoming. This is important if access to service facilities is to be gained, especially in sensitive areas.

A professional research unit must therefore cope with a wider and more complex network of demands and expectations that a "straightforward" scientific unit funded under the dual-support system. Without careful planning and skilled management it is easy for perspectives to become distorted and undue emphasis given to one or other of these expectations, often, sadly, to the detriment of others. The staff of NRU are very aware of this complexity and are planning actively for the future so that the needs of customers, the research community and the nursing profession feature in a balanced way. Given careful thought, there is no reason why a study could not provide valuable information for customers, contribute something of worth to a more general debate on, say, a particular approach to the analysis of data and, at the same time, keep the profession in step with developments through publications geared to the practising nurse. Coupled with an examination of the basic principles upon which the work of NRU is centred, an exciting and vigorous future programme can be envisaged.

It is abundantly clear that clarification of issues central to nursing education and to the role of the nurse in the health service is difficult. The real life situations encountered are complex and the mounting of quantitative studies based upon a purely natural sciences paradigm will achieve little on its own, unless supplemented by carefully designed and skilfully analysed qualitative studies. It is useful, therefore, for NRU to have close links with researchers facing similar problems of method. This is why the growing contacts with the Centre for Educational Studies are already producing results, both informally and by means of seminars, research advice and, hopefully, discussions of future joint activities. In addition to such links, the Unit has access to a small but distinguished advisory committee, interested in the Unit, committed to its progress and development and containing much collective wisdom.

This research programme is identified and agreed with DHSS by a process of discussion. Typically, meetings are arranged between unit researchers and DHSS customers (representing policy divisions) where customer priorities are explored, mainly for researchability. Following this stage, formal proposals are submitted and subjected to external referees, after which approval is given, the proposal rejected, or suggestions made as to possible modifications to the research questions or design. After funding has been approved, the unit is able to advertise for and appoint staff.

In a unit where projects have embraced a wide range of methods—from national surveys to individual case studies—no single design would result in valid and reliable data. A range of quantitative and qualitative approaches have been necessary, for nursing is both art and science. Although quantitative approaches are used wherever possible, we believe that to confine research methods to any kind of positivistic natural sciences design would be overly restrictive, especially in areas central to nursing practice involving values and ethics. Few these days would claim that all advances in knowledge emanate from science so the unit has of necessity utilised methods drawn from "alternative epistemologies" such as social and evaluative research. We believe that only by adopting an eclectic approach to choice of method can the complexities and subleties of nursing be explored.

Projects; Methods and implications

Completed projects and those currently in progress in each of these main areas of work are listed below.

Area		*Completed and ongoing projects*	
1.	Basic education for general nurse learners	1.	The Clinical Learning of student nurses
		2.	Evaluation of experimental training schemes for ward sisters
2.	Port basic nurse eduction	3.	Ward Sister Preparation; A survey in three districts
		4.	Post-registration Development Schemes for newly registered staff nurses
3.	Midwifery	5.	The role and responsibilities of the midwife
		6.	A comparison of the career intentions and views of a group of midwives who took a 12 month course with a group who took an 18 month course
		7.	The career patterns of midwives
4.	Psychiatric nursing	8.	A study of some aspects of the role and education of the nurse in relation to the prevention and management of violence.

In the following brief summary, the methods employed on each project are outlined as are the implications raised by the findings for practice, education and/or management.

1. *Basic education for general nurses learners. The Clinical Learning Project* Keith Jacka and David Lewin

Whatever the future direction of nurse education, for example, super-numerary status or location within higher or further education, the need for good clinical instruction and experience for the learner will not diminish. Methods for measuring and improving clinical learning have been devised in the course of the Clinical Learning Project.

The research comprised a longitudinal study of three cohorts of student nurses, which followed their progress throughout training from the beginning of the introductory course to final qualification. Each cohort was from a different school of nursing, each selected to provide examples of different ways of organising nurse training—modular, modified modular and block. Data was obtained by a variety of means: analysis of published curricula and course programmes; questionnaires completed by and interviews held with student nurses; trained ward and tutorial staff, supplemented by observational studies carried out in the clinical areas to which students were allocated.

The project provided information on the range of clinical responsibilities undertaken by students as they progress through training, the content and timing of educational opportunities in both classroom and ward together with the degree of effective integration between the two.

Those responsible for the education of nurses need this kind of detailed information about individual student careers and wards as learning environments and methods of measurement which enable progress to be monitored and the identification of areas where improvement is needed. The authors are currently working with staff in several schools of nursing, helping them to implement the techniques devised for monitoring their own student nurse programme. This research is of relevance to all those involved in nurse education.

Published as NERU Report No. 6.

2. *Post-basic education*

Adequate preparation of nursing staff for the responsibilities of new roles has been identified as a key factor in staff performance and in the retention of qualified staff; three projects have been undertaken in this area.

2.1. *An Evaluation of a Training Scheme for Ward Sisters*: Judith Lathlean and Sally Farnish

This comprised a three year evaluation of an experimental training scheme for ward sisters. The scheme was based on the premises of a specific need for ward-based training, the appropriateness of a joint service/education approach and the notion of learning from role models. An action research framework was employed which allowed the researchers both to influence the action and to conduct an overall assessment of the programme. A number of key elements emerged from the evaluation. These include the importance of making a specific investment in training for the ward sister role, the value of organising training so as to examine the learning that takes place from working with other more experienced sisters, and the need of ward sisters, particularly when newly appointed, for support in developing their own practice. A crucial theme linking all of these elements is that of commitment by management without which such an approach will not succeed.

The research indicated that there are considerable benefits to be gained from a special programme of preparation for the sister role, and the report provides guidelines and alternatives for the development of such a programme.

Published as NERU Report No. 3.

2.2. *Preparation for the Role of Ward Sister: a survey in three districts;* Sally Farnish

Questionnaires on various aspects of the preparation of ward sisters for their role were sent to nursing staff in three health districts. A substantial majority of respondents considered that insufficient preparation is given for this role. The data generated varied little between districts and strongly suggest there are serious inadequacies in the preparation of nurses for the responsibilities of ward sister. The survey provided valuable information which supports the views of those seeking a new approach to the training for ward sisters.

Published as NERU Report No. 2.

2.3. *An Evaluation of Post-Registration Development Schemes for Newly Registered Nurses*: Judith Lathlean, Gillian Smith and Susan Bradley

The need for schemes to train and develop the newly registered nurse was identified in 1981 by a major seminar comprising representatives of all branches and levels of nursing. It was hoped that the scheme

would be "the first step in a series of initiatives" in an attempt to improve standards of care and enhance career prospects.

The study identified the needs of nurses on completion of their basic training and examined the opportunities available for learning within the first six to 10 months post-registration. It indicated not only how nurses develop during this period but also identified some of the problems and constraints. The study demonstrated that some form of continuing education is vital for all trained nurses and outlines key features essential in this process. This research also raised many implications for practice as well as education, since it explored the relationship between the nurse's role and good standards of patient care and focused on the educational opportunities and processes required to enhance this relationship.

Published as NERU Report No. 4.

3. *Midwifery*

Research into midwifery has covered four main areas: the role and responsibilities of midwives; midwifery education, staffing levels and the career patterns of midwives.

3.1. *The role and responsibilities of midwives*: Sarah Robinson, Josephine Golden and Susan Bradley

This study was commissioned partly in response to concerns that the increasing involvement of medical staff in the management of normal childbirth was eroding the role of the midwife. By means of national surveys of midwives, obstetricians, general practitioners and health visitors, the research investigated the following: the procedures and activities which hospital and community midwives undertake and the degree of responsibility they have for decision-making in normal antepartum, intrapartum and postpartum care; the extent to which the responsibilities of the midwife overlap with those of other health professionals; the variation in the role of the midwife from one type of practice situation to another; the views of midwives and other health professionals on their respective responsibilities for maternity care, and related subjects such as staffing levels.

The main finding to emerge from these data was that although midwives *are* qualified to care for women during a normal pregnancy, labour and puerperium on their own responsibility, many of them were not able to do so because medical staff had taken over this responsibility. In the antenatal period for example, 90 per cent of the hospital midwives and 65 per cent of the community midwives worked in clinics in which medical staff carried out the abdominal examination and made the overall assessment of pregnancy, even if this had already been carried out by the midwife. This not only wastes the midwife's training, but is a duplication of resources in that both midwives and doctors are carrying out the same tasks. The same kind of duplication of resources and skills was found in relation to care during labour and the puerperium.

Data obtained on staffing levels obtained in the course of this project demonstrated a national shortfall of staff, particularly at the grade of staff midwife and midwifery tutor.

Published as NERU Report No. 1.

3.2. *Midwifery training* Sarah Robinson and Josephine Golden

Midwifery training was recently lengthened from 12 months to 18 months for the registered nurse on the grounds that this would allow more time for the student to develop confidence in clinical skills and hopefully increase the percentage choosing to make midwifery a career. Both these issues were explored in the course of a project in which questionnaires were sent out to 800 midwives who took a 12 month course and 800 who took an 18 month course. The data demonstrate a significant increase in the percentage of the latter group who felt adequately prepared to practise midwifery but little difference in the percentage intending to make midwifery a career.

3.3 *Midwives Career Patterns*: Sarah Robinson and Heather Owen

Very little information is available on the long-term career patterns of people who have qualified as nurses, midwives and/or health visitors and their reasons for staying in or leaving the various health professions. A project currently in progress is investigating the career patterns of two groups of midwives; one of whom qualified in 1979 after a 12 month course and the other in 1983 after an 18 month course. This project is a follow-up to the earlier project (3.2 above) which studied the views of trainees and the career intentions of these two groups at the time that they qualified.

The project is investigating the reasons midwives give for remaining in midwifery, for changing from one midwifery post to another and for leaving the profession for other occupations. Factors focussed on include confidence in ability to practise midwifery, satisfaction with use of skills, satisfaction with conditions of service, attractions of alternative employment, domestic and economic factors.

The project is also examining the extent to which career intentions correlate with actual careers followed and whether the career patterns of those over 30 at the time of qualification differ from those under 30. The data on career intentions showed that a significantly larger proportion of the former said that they

intended to make a career in midwifery. Important implications for recruitment are raised if this difference is followed through into careers actually pursued.

The project will provide a substantial data base on reasons for wastage from the profession, identify factors which may allow for some remedial action—such as better management of career breaks—and possibly identify those groups of midwives most likely to remain in the profession. The data will be of importance to those responsible for the maternity services, in view of the concern about the loss of newly qualified midwives to the profession and will add to the body of literature on career patterns of health service personnel.

4. *Psychiatric nursing*

A project investigating the role and education of the nurse in relation to the prevention and management of patients designated as mentally ill is in progress. The research has been commissioned in response to concern that training does not always provide nurses with an adequate base of skills and knowledge in the prevention and management of violent behaviour. It is an area on which little research has focused to date and the project will provide information relevant to those responsible for policy-making in this area. The project has five objectives;

1. To analyse published guidelines on the prevention and management of violent behaviour, in order to identify the range of issues covered and the points of agreement and disagreement.
2. To document provision, throughout England and Wales, of in-service training courses relating to the prevention and management of violent behaviour.
3. To contact all nurses who have taken the JBCNS (now ENB) Course 955 (the care of the violent or potentially violent individual) and to establish their subsequent career and their views on the value of the course to their career.
4. To examine the translation of those parts of the RMN and SEN (M) syllabuses concerned with the prevention and management of violence, into the curriculum for theoretical and practical teaching, with particular reference to the relationship between teaching in the school and teaching and experience in the clinical situation.
5. To document the views and experience of nurses practising in psychiatric hospitals and units, on the prevention and management of violence.

The Nursing Process Evaluation Working Group

Slightly different from the usual run of research projects but one with important research connotations was the Nursing Process Evaluation Working Group which was a broadly based Working Party chaired by Dame Phyllis Friend, ex Chief Nursing Officer, DHSS. From April 1985–April 1986 the Working Group held a number of meetings and took a wide range of evidence on the introduction of the Nursing Process in the United Kingdom. The group drew on a fund of published material in addition to gathering considerable information from organisations, groups and individuals. Although not a critique of the nursing process as such, or a text on "how to implement the nursing process", the report provides considerable insight into the existence and efficiency of elements of the nursing process. It clearly identifies existing research and points the way to important areas for further research. The report spans the interest of organisations and management, practice and education.

Published as NERU Report No. 5.

Data Handling

Nursing research, whether concerned with practice or training, typically generates data suitable for computer analysis, data that is, in fact, intractable without recourse to a computer. Data files are likely to vary from a small file of several hundred lines (each of 80 columns) to a large file of many thousands of lines. Often these numerical data will derive from coded answers to questionnaires, and a common mode of analysis is to use the SPSS set of programmes (Statistical Package for the Social Sciences). This package is widely available, and recent versions are well-designed analytic tools.

As yet SPSS is available only on larger (main-frame) computers. Micro-computers are, however, being used increasingly, especially for generating applications programmes incorporating results of research, which can be understood easily and used in hospitals by practitioners in clinical nursing or nursing education.

Future Programme of Research

The Unit's data base in the areas of student nurse learning, post basic education, the role of the ward sister, the role of the midwife, career patterns and the nursing process continues to develop and now constitutes a sizeable resource much of which is organised by Keith Jacka, the Unit's statistician. Future work will build on this data base and new projects on the ward sister, the nursing process and career developments are now at the planning stage.

DISSEMINATION

Unit staff pursue an active policy of disseminating their research findings to members of the nursing and other related professions, to those involved in health care education and allied research and to the wider research and academic communities. This currently takes three forms:

1. *Reports*

A report is published on each completed project. The sale price covers the cost of printing, post and packing, and of providing complimentary copies for such personnel as Regional Nursing Officers, members of the professional and statutory bodies. The initial printing costs are underwritten by King's College.

There are now six titles in the series all of which are selling well (see attached leaflet).

2. *Publications*

A substantial body of published work arising from the research programme exists and a list of publications is appended [*not printed*]. The list also includes other publications by unit staff on professional and academic issues.

3. *Conferences/study days*

Members of the Unit regularly present papers on their work at national and international conferences, study days, seminars and similar venues. They also organise conferences at which their research and that of other researchers in the same field, are presented to members of the profession.

Jack Hayward
Sarah Robinson
Keith Jacka

September 1987

The Memorandum by the University of London, London School of Hygiene and Tropical Medicine

The London School of Hygiene and Tropical Medicine is a research-intensive postgraduate medical school of the University of London. It is the national school of public health. Its specialist role is in community, occupational and preventive medicine; and in the problems of health and disease in tropical countries. Its research is predominantly epidemiological assessing the risk factors of disease (for example chronic cardiovascular diseases) and occupation (for example the nuclear industry); and designing and evaluating preventive measures. It is therefore concerned in the development of and strategies for the use of vaccines, in the problems of nutrition, water supplies and related diseases, in behavioural factors in disease and its prevention, and in the evaluation of the use of resources in health services. Considerable and important contributions to the understanding of disease and its control in Britain have been or can be made by research overseas for example the influence of diet and lifestyle on high blood pressure, the heterosexual transmission of AIDS and the influence of AIDS on other important communicable diseases such as tuberculosis, the aetiology of diabetes, the treatment and prophylaxis of malaria.

(a) In general terms priorities in medical research are set by peer review committees selecting proposals on merit from initiatives taken by individual grant applicants or groups of applicants. Priority tends to be given to "tidy" applications which propose elegant experiments and which can be quickly achieved – more speculative research and long term research likely to break now ground is probably less likely to be supported in current circumstances. Neglected areas are sometimes identified and special efforts (for example Wellcome Trust Major Awards) made to stimulate them. Sometimes they are "neglected" because of the absence of able people with original ideas to put forward proposals, and units or new posts around which research training can be developed may be needed. The wide range of grant applicants probably cover the health needs of the nation. Priorities may be expressed by directed research (for example MRC contracts) in major areas (for example the new funding for research on drugs and vaccines for AIDS under MRC). Research at the interface of disciplines in different reseach councils or different university faculties are more difficult to obtain funds for: for example the potentially important juxtapositions between social and biomedical sciences. It is in this area that the needs of the NHS, particularly in health services research and evaluation, are probably less well served because of under investment in research posts, careers and resources in this area by DHSS, NHS Regions and Districts.

(b) The relevant Research Councils appear to be underfunded in that substantial numbers of high quality research proposals are not being funded. The tendency has been towards shorter term research grants (three years is probably now the norm) and to cut them to the minimum level possible. The consequence is concentration on short-term objectives certain of success within three years; and to a time consuming frenzy of continual preparation of grant applications by those most experienced in research. Clinical research is being vitiated by clinical staff shortages and increasing patient loads in NHS teaching hospitals. A good balance will only be achieved by more generous funding. Too high a proportion of

research staff are employed on short term contracts often over very long periods. They have very limited career prospects in research and because of reduced funding in University departments only poor prospects of being absorbed into senior University posts.

(c) Medical research tends to develop in response to the availability of new techniques and technologies and to the impetus provided by leading figures in particular fields; and "neglected areas" often lack such stimuli for example health services research.

(d) Institutions funding research are generally knowledgeable about what other institutions are doing and formulate their polices to be generally complementary. Peer review depends on the use of referees who are well informed about what is going on in their fields.

(e) The results of research are probably adequately disseminated—at any rate in the United Kingdom. However it is less clear that their utility is adequately tested and evaluated that is lack of health services research.

(f) Peer review by experts in each field who are knowledgeable about research completed or in progress.

(g) If it is not sufficiently reflected in care, prevention or health education, it is probably because of the lack of resources for test and evaluation (see (e)).

(h) The Research Councils are less and less able to support research training that is places on course such as this School runs to provide a sound basis for research; and places for research students. Particulary in relation to communicable diseases, research training overseas where communicable diseases are more common can be very valuable. This is becoming more difficult with the shrinkage in the number of research units overseas with British staff to supervise the research training. There is a need for some form of career structure for British research workers serving overseas so that experienced people can remain overseas to preserve Britain's high but declining reputation for contributions to the solution of international health problems, particulary in developing countries.

Letter from the University of London, Royal Postgraduate Medical School

A circular from the Committee of Vice-Chancellors and Principals indicated that the House of Lord's Sub-Committee were interested in further comments on several topics including the broad science base for medical research and the problem of recruitment to post-doctoral research posts.

Recruitment of post-doctoral scientists

Experience at the Royal Postgraduate Medical School supports the view which has been expressed to the Sub-Committee that there is a problem with recruitment to post-doctoral posts for non-medical scientists. The paucity of applicants to such appointments (which are usually short-term funded by research grants) is in contrast to the keen competition for the equivalent clinical posts. Staff who have interviewed both those who were appointed and those "who got away" suggest the reasons for the shortage are:

(1) The natural desire of young research workers who have no family commitments to combine their post-doctoral studies with travel abroad. We have lost several promising candidates to North America where there is an abundance of attractive well paid appointments.

(2) The anxiety of those with family commitments to find a secure job as soon as possible in view of the poor career opportunities for those who spend a number of years in research posts.

The latter problem particularly affects medical schools where there are very limited promotion prospects for non-medical scientists. This shortage is particularly severe in postgraduate schools which lack preclinical science departments. A more adequate career structure for non medical scientists in medical schools is vital. Even the miserably inadequate structure that currently exists is being continuously eroded by the underfunding of the universities—particularly the failure to adjust the UGC grant for pay awards. The requirement on medical schools to pay wage awards where they have no part in negotiations without reimbursement necessitates a continuous reduction in career posts. Since clinical posts are essential to the hospital service job losses are bound to fall selectively on scientific posts. This is viewed at the RPMS as one of the most serious threats to clinical research in the United Kingdom.

December 1987

Letter from the University of London, Special Advisory Committee on Nursing Studies

As there is a major centre of nursing studies and research in this university, we wish to report on progress and priorities in this area allied to medicine in response to your letter of 29 July 1987 to the Secretary General of the CVCP. Substantial evidence has already been produced by studies into clinical nursing care. These include areas such as pain assessment and nursing interventions, methods for reducing anxiety in general patients and thereby improving surgical recovery, comfort measures for those who are terminally ill and intervention aimed to help people cope with chronic illness. Behavioural psychotherapy and community psychiatric nursing have both been positively evaluated.

For the past decade, over 80 per cent of funding for nursing research has been channelled through the DHSS via its committee system. Although the amount has varied annually between £2 million and £1 million per annum (declining over the last two years) this has had a substantial effect. Growth of research evidence to guide practice, education and the organisation of nursing has been impressive over the last two decades. However, the recent reduction in available government sponsorship might have serious implications for the future service and contribution to the discipline of nursing.

At present the nursing research liaison group is the only grant-giving body for nursing at the DHSS and plans to concentrate on customer initiated research and maintain research units (such as the Nursing Research Unit at King's College London). In addition, a shift of resources to the MRC for health services research, intended in part to represent the needs of nursing research has not resulted in the award of any monies for this as yet. Researcher-initiated work has therefore not been very successful in attracting funds. One or two researcher-initiated projects (one in psychiatric nursing) have been supported by the DHSS, but it has taken over a year to receive the grant. Nursing research was also deprived two years ago when the DHSS Small Grants Committee was discontinued. With a multi-disciplinary membership, aiming to support new research areas within many academic departments, this had become the only avenue for nurse researcher initiated proposals. In this university we have been successful in obtaining grants from other bodies, but this does mean a lack of central coordination and stimulation which was so valuable in the seventies.

As the King's College Nursing Research Unit has submitted evidence via the DHSS to your Committee, other research work of the Department of Nursing Studies and their priorities will be reflected in this paper. Our efforts are, in the main, directed towards clinical practice, aimed to improve the effectiveness of care and evaluate ways of improving health and recovery. (An appendix provides a synopsis of current work).

Nursing must be seen in the context of growing health needs in our population, and as the largest and thereby most expensive aspect of the National Health Service. It is therefore imperative that funds should be available for these key areas.

Health Promotion and Preventative Care

Currently statutory bodies in nursing are recognising the need to shift the educational focus of nursing away from the study of diseases towards prevention. Health promotion is indeed one of the priority areas for the government, yet far more research is needed, not only into the science of prevention, but also on strategies for integrating this within the role of health care professionals, in particular nurses. We have already produced significant work in this area, but the Health Education Authority seems uncertain about its future research funding responsibility and this may interrupt vital progress in this area.

Care of the Elderly

Each decade the number of pensioners increases by at least one million. Although this should not infer that old age is a nursing condition, the elderly and frail are more vulnerable to frustrating degenerative conditions which reduce their level of independence. Nurses have always been seen and wish to become more responsible for the care and support of this group. With more research building on rather encouraging initial studies, prevention of debility in this group could lead to a much greater quality of life (and of course huge savings in cost).

Inadequacies of the Present Service

There is no doubt that the Royal Commission on the NHS highlights the depersonalised, fragmented and bureaucratic service that our population receive. Stress of hospitalisation, caused by poor communication, must be rectified and lack of continuity in care results from poor coordination. Increases in the level of chronic disorders indicate that the service needs to respond by providing more liaison between home and hospital. Nursing research into preparing people for recovery at home and coping with chronic and acute conditions is now quite impressive. Yet there is a great need for more field trials to establish better practice in all health districts.

Concluding Comment

There is a crisis in nursing recruitment and retention, particularly in London. Recent research by the Institute of Manpower Services demonstrates that poor managerial support and salaries are to blame. Yet

several areas of good practice are successful in attracting and retaining nursing staff. Good practice is obviously based on careful use of applied research and when this is demonstrated it not only improves the experience of clients, but also nurses. Research and practice are intrinsically linked and our rapid progress in the last two decades really demonstrates the positive effects of relatively small government investment.

Recommendations

This University cannot over-emphasise the importance of central funding and DHSS professional support. However, a nursing research budget should be clearly delineated and distributed between government and researcher-initiated projects. Without this, the research section at the DHSS is forced to fund service or management-related work, such as manpower studies in response to topical problems, which may not have significant future benefit for the science and practice of nursing. Restoration of the small grants committee would do a great deal for nursing research, as would a large increase in the number of nursing research studentships, both so fundamental to the whole impetus of creating research and researchers.

The University of London supports nursing studies and research as an area of vital importance to the welfare of those the government serves.

Dr E W Thompson
Secretary,
University of London Special Advisory Committee in Nursing Studies

October 1987

Letter from the University of London, School of Pharmacy

Having recently seen a copy of your letter on this subject to the Secretary General of the CVCP, I write in my capacity as Chairman of the University Grants Committee's Panel on Studies Allied to Medicine, and also as Vice Chairman of the Committee of United Kingdom Heads of Schools of Pharmacy.

I note that the enquiry includes, *inter alia,* research in sciences with a bearing on medical research and research and development in the Pharmaceutical industry.

Taking, first, the subjects allied to medicine coming within the purview of the relevant UGC Panel, these include pharmacy (of which more below), pharmacology (on which you will have submissions as a major pre-clinical subject but which is researched effectively in universities/schools other than medical schools), nursing, ophthalmic optics, nutrition, and toxicology. Each of these subjects is under-resourced for research and those which are relatively new on the university scene are seriously so. It will be self-evident that good quality research in each of the areas mentioned will have obvious beneficial effects on the quality of service offered within the NHS. To date, most of the subjects mentioned above have not received the priority they warrant in the funding of medical and medically-related research.

In regard specifically to pharmacy—note should be taken of the excellent quality of research—both basic and applied—conducted in several Schools of Pharmacy. These types of research are clearly inter-related in the pharmaceutical context and Schools of Pharmacy have an important role not only in directly collaborating with our nationally and internationally important pharmaceutical industry but also in providing research training for graduates who are indispensable to that industry. The pharmaceutical sciences bridge chemical and biological disciplines and are applied to a wide range of problems of interest to several research councils. A particular problem in the past has been the mechanism (the route for) some research project applications, for example those relating to formulation studies, which come within the fields of interest of both the SERC and MRC.

A major problem of recent times, of course, is the depletion of resources for the Research Councils coinciding with the very large cuts in provision for higher education.

In regard to the professional practice of pharmacy, "The Report of a Committee of Enquiry appointed by the Nuffield Foundation" recommends a widespread increase in clinical pharmacy throughout the hospital service and there is a clear need for a significant increase in research in this area. In relation to community pharmacy practice, the Committee of Enquiry noted a dearth of relevent research and there is an urgent need for this to be undertaken with funding, for example, from DHSS.

I am aware that the Pharmaceutical Society of Great Britain is submitting detailed evidence in response to the questions raised in your letter and I am confident that Heads of Schools of Pharmacy will concur.

Dr F Fish
Dean

April 1987

Supplementary Submission by Dr Fish in the form of a letter to him by Professor Malcolm Rowland, University of Manchester, Department of Pharmacy

Alan and I have considered the document from the Science and Technology Committee, and feel that one area in pharmacy/medicine that might be worth proposing as requiring an increasing resource is *Clinical Pharmacokinetics*. The logic behind this suggestion is as follows.

Drugs continue to be a mainstay in the treatment and amelioration of many diseases and symptons. Unfortunately, however, they are not without risk and failure is not uncommon. Patients differ widely in their response to drugs and unless dosage is adjusted to the individual, some patients will receive excessive drug with resultant toxicity while others will be ineffectively treated. In either case, the results are deterioration in the quality of life of the individual patient, to the point of the occasional fatality, and an increasing cost to society.

Patient variability in response to drugs is in part due to differences in the way they handle them, viz pharmacokinetics, and in part due to differences in response to levels of drug within the body, viz pharmacodynamics. For many drugs, variation in pharmacokinetics is the major source of the variability in response.

Over the last two decades our understanding of experimental and theoretical aspects in pharmacokinetics, together with the associated analytical methods for determining drugs in body fluids, has increased enormously. Limited application of the principles to certain classes of drugs, such as the antiepileptics, in the clinic has yielded substantial improvements in therapy. There is now the need to extend the clinical applications of pharmacokinetics to many other classes of drugs and to certain groups of patients that are at particular risk, such as the elderly (who receive the majority of drugs, often as polypharmacy), the very young (often called the therapeutic orphan) and those with renal and hepatic impairment. What is required is the development of cheap, rapid and specific "bed-side" assay methods, using biosensors, the establishment of expert systems to facilitate optimal adjustments of dosage based on the analytical and clinical information, as well as basic investigation into the sources and causes of variability in patient response to drugs. Of necessity, the research would have to be multidisciplinary.

April 1987

Memorandum by the University of London, St Mary's Hospital Medical School

St Mary's Hospital Medical School, University of London, welcomes a select committee enquiry into priorities in medical research at this time. Although small in number of medical students, St Mary's has a long record of successful biomedical research, including two Nobel prizes (for the discovery of penicillin and the elucidation of the structure of immunoglobulins), and presently has the highest ratio of grant funding to UGC funding of any London undergraduate medical school, and the highest in the United Kingdom with the exception of Oxford. Moreover, the priority of the School has always been the integration of excellent clinical and basic research, to a point where we even question the validity of the division between the two.

At present, the areas of research where we have an international reputation include AIDS immunology, treatment and drug development; transplantation immunology; the genetic basis of adverse reactions to drugs; the application of recombinant DNA technology to clinical practice (particularly in relation to pharmacogenetics, cystic fibrosis, clef palate, Alzheimer's and other complex inherited diseases); imaging techniques and computer storage and analysis; cardiovascular medicine, particularly in the identification of those at high risk; the care of the at-risk pregnant woman and the use of non-intervention monitoring in labour; holistic and alternative medicine, and the role of the doctor in an inner-city community with a high amount of deprivation. Therefore, the £7 million per annum that we spend on medical research spans areas from the most technologically based to the most community-orientated. Since we have virtually no endowment funds of our own, we rely completely upon open competition for grants and contracts, from the Research Councils, the medical charities and industry.

We will offer the views of our Medical School on each of the points raised in your letter of 5 March 1987; we will also participate in the CVCP effort to reach a common view from all of the Medical Schools. We will respond to each specific question using the designation used by the Clerk.

(a) Priorities are rarely set at all. The great majority of medical research originates from the interest of an individual or group of scientists or doctors, who then attempt to obtain funding from the NHS, the Research Councils (in particular the MRC), the medical charities or industry. Directions of research follow the availability of funding. In general, the allocation of research funds takes place on the basis of peer review of scientific merit and clinical and fundamental importance.

Occasionally (as for AIDS), a tranche of funding becomes available, which defines a priority area and attracts research applications. More often, an individual succeeds in a research endeavour, and then is able to build upon this success in their particular area of interest. On a few occasions, the NHS, the MRC or a charity will decide that a priority exists, often of a practical kind, and will fund research (perhaps best described as "contract research") to meet a need. This funding mechanism is rarely used in the United Kingdom University sector, which in general operates on the basis of intellectual competition, at least in theory.

It is difficult to say to what extent the particular needs of the NHS, or the nation, are reflected. In the past, United Kingdom medical research has been the envy of most of the rest of the world, with a record in many areas (particularly the more fundamental) of which we can be justly proud. We have identified certain areas in section (b) where we feel that greater priority could be given to research. However, the major problem facing the Universities, and the nation, is how best to safeguard our tradition of first rate research at a time when resources are being cut and demoralisation is rife, particularly among the best younger scientists and doctors.

(b) It is very difficult to predict which areas of medical research will lead to the most significant advances. These are not always those most obvious, nor those where there are apparent short-term commercial benefits. For instance, for many years molecular biology was regarded as esoteric and of little practical use, yet now it is the most rapidly advancing area of clinical science in many different spheres. Similarly, the advances in imaging, computerisation and material science rest upon fundamental research in engineering and metallurgy. Therefore, we would argue that priorities (that is, which research is to be funded most generously) should be determined as at present, by diligent peer review through the MRC, and analagous committees of the charitable bodies.

However, we would argue that changes in balance are required, but of a different kind. Most research of high quality today is interdisciplinary. It is often expensive, and requires a research group of a certain size to be effective. More effort should be made to ensure that institutions are encouraged (both in principle and by the provision of funds) to collaborate; this is something to which we give particular attention at St Mary's, and much of our research involves more than one hospital or medical school. There is nothing wrong with competition in research, provided that it is limited to those with excellent ideas and technology, and is not interpreted as a license to allow proliferation of a large number of tiny groups of doubtful quality, each unable to conduct a valid programme of work. It does seem, however, that more effort could be made to ensure that cancer research, which takes such a high proportion of the total public research budget, is better coordinated between the various charities and the MRC.

The role of the NHS in direct funding of research is complex. Some large projects are funded centrally, often in response to public or political pressures (as for AIDS research), sometimes from DHSS and sometimes via the MRC. There are only small amounts of money available to Regions to fund direct research, and this is supposed to be used to fund all groups of NHS staff, including those who do not work in University hospitals, and in particular younger people who may otherwise find it difficult to get a start, and operational research which may not qualify for MRC grant support. While these objectives are laudable and sometimes are met, it is also important to ensure that the resources of Regions are not deployed in small and ineffective competing projects, but are focussed on projects of high (if sometimes different) standard.

There are certain areas which are grossly underfunded by any criteria, in spite of a high priority in national terms. The most obvious are mental retardation, mental health, and physical and mental handicap. Another area is that of community health, particularly in the inner cities, and with special needs groups, such as those national groups which entered Britain since 1945. Mechanisms should be found to ensure that prevention as well as treatment is accorded priority, particularly for cardiovascular disease and cancer. However, there is not point in providing funds if first rate doctors and scientists with an interest in research are not willing to work in an area; funding poor or inadequate research is always a waste of resources, and resources should be given to those groups (and there are some) in these areas which are of a high standard.

(c) Priorities do adapt over time, partly as younger persons come into a field and acquire responsibility and resources, partly due to funding availability. By definition, it is easier for a new, younger person to set up a new group which adapts to changing needs and technology than to

change the thoughts and practices of existing groups. In our view, the most serious problem of the limitation of resources is that younger clinicians and scientists are being starved of funds and opportunities. Therefore, the new priorities are not being adapted to, because those who would adapt are either left without resources in the present situation and become demoralised, or leave the country for other places, particularly the United States, where generous resources for young research workers are freely available. It should be emphasised that (although the "brain drain" has always been a problem) the situation is much worse today as compared to twenty, or even ten, years ago.

(d) At St Mary's, we attempt to appoint senior and junior staff, and to allocate our own very limited research funds, in such a way as to strenghten our areas of expertise, within the constraints imposed by our need to offer a full range of clinical services and teaching. We could do this more effectively in the past, when the dual support system was still in existence; today, our research efforts depend almost entirely upon funding raised from outside the UGC system. Therefore, priorities are set by those members of Departments who can raise grants.

(e) The results of research are usually published quickly and known widely through refereed journals. In our experience, with the exception of a very small amount of commercial research carried out on contract, there is no problem in this, since any biomedical scientist is most concerned that results are disseminated to the maximum extent possible. However, while this is true within the research community, there is often a problem in dissemination of results from the scientist and clinician to the health service policy makers and planners. We find that in practice results with service implications can often be ignored for a considerable time.

(f) Although duplication of research has always been a matter of concern to the funding bodies and the public, in our experience the non-productive duplication of research is a rare event. Peer review, combined with the high cost of research today, ensure that new projects which duplicate those already under way in existing groups are only funded for good reason—if there is a lack of confidence in the existing group, or if the project is of such breadth and importance that there is room for more than one approach to a problem. As long as peer review at a high level continues, we feel that unnecessary duplication is not a problem; after all, who would commence work on a project if another group were already most of the way to the answer? In some critical areas, it may even be desirable for experimental findings to come from more than one laboratory.

(g) Once again, this question seems to us to be based on a misunderstanding—the view that biomedical research workers conduct research in a vacuum remote from the needs of patients, and from clinical practice. Certainly in our teaching hospital, where all Departments operate on a single site and where patient care and research are conducted in the same groups and often by the same persons, research is certainly reflected quickly in improved patient care; where delay occurs, it is usually because of the stringent regulatory practices which are (correctly) required before treatment can follow research. Further, where a medical school (such as St Mary's) requires research from all teaching staff, new advances in research are also reflected in the education of students.

There may be problems in the case of medical schools where a major part of the research effort is separated from the hospital, where studies are carried out in research institutions remote from a clinical setting (as for NIMR), or in the education of health professionals other than doctors (and in particular nurses). We have no direct experience of this at St Mary's. Indeed, in our Pathology departments the NHS diagnostic laboratories are closely integrated with the academic departments, to their mutual benefit.

(h) We welcome initiatives, such as that of the MRC, which provide the opportunity for a period of several years' research for "high flier" clinicians, and similar opportunities which have been pioneered by the Wellcome Trust. However, we note that the policies of JPAC, and "Achieving a Balance", will lead to an inflexibility within the training grades which will militate against clinicians entering biomedical research. The needs of research and research training rarely figure in the priorities set in, for instance, manpower planning in the NHS.

We feel that every clinician who aspires to a post at Consultant grade in academic medicine should spend at least two years in full time biomedical research, normally leading to an MD or PhD. We recommend that the career progression within the service should be structured so that this is seen as the normal rather than the exceptional case. We are attempting, with Imperial College, to start what might be called an MBBS, PhD course, where excellent clinicians in training can receive both medical and scientific qualifications in an integrated way. However, we note with dismay that the MRC has been forced to cut the number of students that it can fund to read for intercalated BSc courses, surely an excellent way to provide an early training in research for doctors, who will in due course be involved in medical research.

There are major problems in the entry of scientists into biomedical research. First, we are not training enough good persons in the sort of interdisciplinary fields (for example, bioengineering, or molecular biology) that are required today. Second, the salary structure for biomedical

scientists is inflexible and not competitive with rates that can be obtained outside; even today, it is possible for the head of a research group at the age of 30 to obtain little more than £12,500 per annum. Third, while we do not favour tenure at a very early age, there are few posts (with the exception of those offered by the Wellcome Trust) which give a measure of security and responsibility (what we call a "rolling five year contract") rather than a one, two or three year post-doc with no security at all. The fact that many medical charities offer grants which are renewed annually creates particular difficulties for those attempting to carry out long-term research of high quality. As a result, many of the best young persons with first degrees in biomedical sciences are not studying for PhDs at all, but are entering industry, the City or going abroad at a young age.

(i) The problems discussed above will not be solved by money alone. However, we feel strongly that improvements cannot and will not take place unless more money is made available, both through the UGC and especially to the MRC. In particular, the present situation where the MRC receives no guarantees that financial changes (such as pay rises which it must meet) will be compensated leads to a very destructive situation, with no possibility of planning over even the medium term. Finally, there should be some degree of overall planning and integration between the DES, DHSS, MRC and the medical charities, to ensure that policies are operated which are consistent and supportive over a period of time.

We would welcome an opportunity to address the Sub-Committee of the Select Committee to enlarge upon these points.

Memorandum by the University of London, Thomas Coram Research Unit, Institute of Education

Dr Ann Oakley, Deputy Director.

Research involvement: *Social Support and Pregnancy Outcome* (a multicentre randomised controlled trial of a social support intervention in high risk pregnancy with other pregnancy outcomes); *Attitudes to Contraception* (with Dr A McPherson in Oxford); *Childcare & Parental Health* (with principal investigator Jennie Popay); *Human Resources in Perinatal Care* (with the European Regional Office, Maternal and Child Health Unit of WHO)

Jennie Popay, BA, MA, Senior Research Officer.

Current principal investigator on an ESRC funded study of *Patterns of Health and Health Care amongst Parents of Dependent Children.* Also involved in work on *The policy implications of women's experience of poverty; The material conditions of women's unpaid work in the home.*

National Perinatal Epidemiology Unit, Oxford

Jo Garcia. Social scientist.

Current research (with colleagues): A study of policy and practice in midwifery care in English health authorities; evaluation of social factors and outcomes in randomised controlled trials—Franco-British collaborative research on perinatal health care variations.

Alison Macfarlane. Medical statistician.

Current research: documentation and analysis of trends and geographical variations in stillbirths, infants mortality, termination of pregnancy and low birthweight; international comparisons of infant and perinatal mortality rates.

Miranda Mugford. Economist.

Current research (with colleagues): economic evaluation and randomised controlled trials; an economic study of factors influencing the outcome of maternity care.

Document 1.

In Government-funded research Units there is, at the present time, widespread concern about an issue that relates to question (e) in the Sub-Committee's list of 9. This is the issue of whether the results of research are adequately disseminated.

Appended to this document is a photocopy of the old and the new clauses relating to publication of research findings as they appear in contracts issued by the Department of Health and Social Security to the research units for which it provides core funding on a rolling contract basis.

About 35 Units are potentially affected. The "new" clause appears in the contract when it is up for renewal. Whereas, according to the old clause, the Department had merely to be given an opportunity to comment on any research report, in the future publication requires the prior consent to the Secretary of State. Where consent is given, it may be subject to conditions.

It is, of course, difficult to predict how this "right to censor" may work in practice. But given the importance of DHSS-funded research in the field of health and social policy, there are grounds for being seriously concerned about this development. Even if the "right to censor" is never invoked, the capacity of researchers to present full and truthful accounts of their research findings may be seriously affected.

The new clause also challenges the concept of academic freedom. According to a Hansard statement by the Secretary of State for Education on 16 March 1987, "The Government are determined to sustain the free circulation of ideas and freedom of speech within the law in all publicly funded institutions of further and higher education". The proposed contract changes would appear to be in conflict with their laudable aim.

October 1987

"New" Clause

7.1 The copyright in all research materials (including basic factual data sometimes referred to as "raw" data) and results of research in which copyright may arise by virtue of the Copyright Act 1956 or any re-enactment or modification thereof for the time being in force, prepared as part of, incidental to or resulting from the research, shall vest from the outset in the Crown.

"7.2 Any publication of research material or of the results of research (as described in sub-paragraph 1 above) or of matters arising from such material or results is subject to the prior consent of the Secretary of State, which consent shall not be unreasonably withheld. Such consent may be given either unconditionally or subject to conditions, in which case any publication shall be subject thereto.

7.3 Where a consent to publication is sought from the Secretary of State under sub-paragraph 2 above one draft copy of the proposed publication shall be sent to him at least 28 days before the date intended for submission for publication, so that he may consider not only the content thereof but also may advise the Researcher as to matters pertaining to Crown copyright, royalties and confidentiality. After publication the Researcher shall supply two copies of the publication, free of charge, to the Secretary of State."

7.4 Where acknowledgement of Crown Copyright is made in any publication it shall be in the form of (c) Crown Copyright Reserved 19XX (year of first publication.)

7.5 In any event, every publication shall acknowledge the Department's assistance or carry such disclaimer as the Department may require or both or otherwise as may be directed by the Secretary of State.

7.6 At least ten copies of a report produced in pursuance of paragraphs 6.2 or 7.2 above shall be sent to the Secretary of State. In addition once the report has been finally accepted by the Secretary of State, the Director shall send two copies to the Liaison Officer for the Department's Library; and subject to conditions relating to confidentiality in this or any relevant project research contract, one copy to the British Library Lending Division, Boston Spa, Wetherby, West Yorkshire LS23 7BG; and one copy to the British Library Copyright Receipt Office, 2 Sheraton Street, London W1V 4BH. A further five copies shall be reserved by the Director as these may be required within one year of the document having been deposited with the British Library Copyright Receipt Office, for the other copyright libraries in the British Isles at Oxford, Cambridge, Edinburgh, Aberystwyth and Dublin.

"Old" Clause

9. *Results of Research*

9.1 When it is proposed to publish the results of research carried out under this agreement for the Department, the Director will before submission for publication, furnish a copy of the proposed publication to the Department through the Liaison Officer, and invite the Department's comments. The Department will use its best endeavours to reply within 30 working days. Any comments made shall be considered by the Director but the Director shall be free nevertheless to allow publication to go forward in the original form if he thinks fit.

9.2 At least ten copies of the report should be sent to the Secretary of State. In addition once the report has been finally accepted by OCS, the Researcher shall send two copies to the Liaison Officer, for the Department's Library; one copy to the British Library Lending Division, Boston Spa, Wetherby, West Yorkshire LS23 7BG; and one copy to the British Library Copyright Receipt Office, Store Street, London WC1E 7DJ. A further five copies shall be reserved by the Researcher as these may be required within one year of the document having been deposited with the British Library Copyright Receipt Office, for the other copyright libraries in the British Isles at Oxford, Cambridge, Edinburgh, Aberystwyth and Dublin.

DOCUMENT 2.

Research concerned with the health of the nation includes not only medical research (basic and clinical research carried out by medically-trained staff) but also a very large body of work undertaken by social scientists (economists, psychologists, sociologists etc.) thoroughout the country. We are concerned in this document primarily with health research carried out by social scientists; with the *reasons* why such research activity forms an integral part of the work required to assess the health status and health care needs of the nation, and with the *current and future status* of health research in the social sciences. This latter issue is particularly important given current developments in the *funding* and *priorities* of health research more generally.

Why social science health research?

There is a long tradition within social science of research designed to document the living conditions of the nation likely to have an impact on health status and health needs. The surveys carried out by Booth and Rowntree in the late nineteenth century documenting the conditions of the urban poor are well-known examples. Such information has always made an important contribution to the development of strategies and specific policies (wherever orchestrated) to improve health. Some Government statistics, including The General Household Survey and Social Trends, as well as one-off reports such as the Black Committee's report on Inequalities in Health and the BMA report on deprivation and ill health play a similar role.

In his "Enquiry into the Social Science Research Council" (1982) Lord Rothschild stresses the value of social science as a "check on the credibility of entrenched commonsense beliefs". This is, of course, a function of all scientific activity. But in the social science field entrenched commonsense beliefs are likely to be especially dominant, as everyone believes her/himself to be some kind of expert.

So far as health research is concerned, social science research activity has a particularly important role to play in the following four areas:

(1) Provision and analysis of information needed to assess the relationships between (a) the health of individuals and their requirements for health services; and (b) their social and economic living conditions. (See as an example Appendix A). Some relevant data exist in the form of routinely collected statistics which can be used to monitor trends and identify hypotheses which can then be studied in greater depth through other approaches. Although it is not appropriate to collect detailed data about people's social and economic circumstances through routine statistical systems, they can be used to relate simple socio-economic indicators to data about people's health and use of the health service.

It is unfortunate therefore, that new NHS data systems which are being set up at greater expense following the recommendations of the Steering Group on Health Services Information, focus overwhelmingly on administrative data, with only limited clinical data and no indicators of the socio-economic circumstances of people who use the NHS. (It is claimed that people's post code of residence could be used in conjunction with census data to provide a proxy indicator. However, given the infrequency of censuses and the variability of circumstances of people living in the same section of a street, this is not satisfactory.)

(2) Evaluation of the determinants and implications of policies in the health and social service and clinical domains. See as examples, Appendices B, C and D.

(3) Assessment of the impact and effectiveness of health technologies. See Appendix E.

Some aspects of technology assessment fall in the clinical field—for example, those which have specifically to do with short-term clinical outcomes. However, a narrow approach to technology assessment runs the risk of omitting important nonclinical and/a long term outcomes (such as, for example, the impact of a particular perinatal procedure on the long-term development of intra-family relationships). The question of the costs and benefits of technology in its broadest sense is an urgent one in the provision of health services today, as technological innovation has increased the number of expensive specialist techniques available to the point at which national budgets for health services cannot possibly stretch to make these techniques available for those "in need". A related issue is the exploration of low-cost, low-technology alternatives. See Appendix F for an example from the field of perinatal care.

There is a further area of health care related to technological change in its broadest sense in which social science research has made important contributions. This is the organisation of services. In the light of the current emphasis on effectiveness and efficiency in health care such research is particularly pertinent. Social science research can illuminate constraints on organisational change as well as exploring the potential role of different professional groups and the relationship between them. There have been many examples of both survey based and more qualitative studies in this area.

(4) The collection of information needed to develop and evaluate programmes of health education for particular groups within the community. As the costs of health care rise, there is increasing emphasis on the role of education/information designed to encourage individuals to adopt

healthier life-styles. However, many health education programmes have not been effective, at least in part because they have not been based on knowledge of the health beliefs and practices endemic in the target community. (See Appendix G for example).

Additionally health education initiatives will be ineffective if they fail to address the wider social determinants of individual behaviour. Qualitative social science research has a unique role to play in helping us to understand these complex procedures which link individual behaviour to living conditions (see Appendix H for an example).

The current and future status of social science health research.

Most social science health research is carried out by researchers on short-term contracts. The conditions of service of these researchers have always been poor in comparison with other professional groups, and are further threatened by the current cuts in research funding (See Appendix I for more detailed documentation of the position of academic-related contract research staff in one area).

Table 1 is taken from the Office of Health Economics report *Crisis in Research* (1986). It shows Government expenditure on research and development by department in 1983–84. The main bodies funding social science health research are the DHSS and the ESRC whose joint contribution to the R&D budget in 1983–84 was £45.2 million (a figure which includes the funding of non-health research and, in the case of the ESRC, the vast bulk of government funded social science research of whatever description). By comparison the MRC budget in that year was £113 million. (This figure includes a small amount of nonclinical work).

TABLE I

Government expenditure on research and development by department in 1983–84.

Department	*£ millions*
Civil Departments	
MAFF	118.6
DES	11.4
DEn	34.0
UKAEA	203.8
DoE	32.4
ODA	20.8
DHSS	27.7
HSC	8.3
Home Office	12.2
DTI	313.1
DTp	27.8
NI Departments	14.3
Scottish Departments	49.5
Other Departments	33.2
Total Civil Departments	907.4
Research Councils	
AFRC	44.4
ESRC	17.5
MRC	113.0
NERC	59.8
SERC	245.1
Total Research Councils	479.8
UGC etc	551.0
Total Civil	1,938.2
Ministry of Defence	
MOD (Research)	357.2
MOD (Development)	1,555.8
MOD (Staff & Superannuation)	71.0
Total Defence	1,984.0
Net Total	3,923.0

Source: Annual Review of Government Funded R&D 1985.
Office of Health Economics *Crisis in Research*, 1986.

In 1984–85 the DHSS spent 0.1 per cent of its total public expenditure covering social security, health and personal social services on R&D. Cuts since then in present and projected R&D expenditure worsen

this position. In addition, the new research priorities recently given Ministerial approval are making it much more difficult for social science health researchers to acquire DHSS funding. (The two main headings under which such research must be squeezed are "consumer satisfaction" and "the influencing of lifestyles".)

When one adds to this picture the changed financial and political circumstances of the other main funding body for social science health research, the ESRC, the position looks very grave indeed.

In such circumstances, and when funding opportunities for medical research in the narrow sense are also reduced, there is a tendency to assume that priority should be given to basic and clinical research. However, the evidence suggests that if the object of all this research activity is to safeguard and improve the nation's health, then both streams of research are needed, and must continue to be funded.

Letter from University of Manchester, School of Biological Sciences

Your letter of 16 March 1987 to Mr N Davies, Registrar of the General Dental Council has been passed to me for comment by the Dean of the Dental School, University of Manchester.

The University Dental Hospital of Manchester has a large and well organised committment to dental research which is planned to meet the main problems to be faced in the future by the dental services of the nation. A basic outline of the research programmes conducted within the Dental School is given in the attached brochure entitled "Opportunities for Research at the University of Manchester Dental School". The basic research programmes of the Dental School are completely integrated within the School of Biological Sciences at the University of Manchester. This large School of Biological Sciences conducts research which is relevant to a number of medical and dental conditions. Such studies range from patient orientated investigations, through animal models, to basic cellular and molecular studies. The organisation of such basic research within targeted research groups, which form part of four large departments, is described in the attached green leaflet which summarizes the major reorganisations in Biological Sciences at the University of Manchester. The research programme of one of these departments, namely Cell & Structural Biology, is described on the attached xerox sheets which summarise current work on a number of areas of medical importance.

The Dental School has considered the questions posed by Sub Committee II and has offered responses based on its own experience in the field of dental research.

(a) The Dental School's priorities are based on its own current strengths. These are Dental Biological Sciences, Biomaterials Sciences, Epidemiology and Community Studies and Dental Education. Although we believe that research should be driven by original and creative thought processes, associated with a critical appraisal of current knowledge, rather than by immediate applications or areas of likely short term success, nevertheless research workers appreciate the current problems in health care and direct their efforts to meet these at least in the long term.

(b) The resources allocated to dental research are so limited at present that it is impossible to cut back on any aspect. It is essential that sound, first-rate research programmes are funded. Particularly important are programmes of training in research for high achieving, young research workers, for they will provide the essential base for future studies. Research areas of particular importance include fundamental studies on cell and molecular biology of oral tissues and their diseases, novel materials and techniques and more effective and efficient delivery systems. At present, the funding of dental research both at a basic and clinical level is so meager that several good researchers and centres are starved of funding. What is required are more resources. As well as increased numbers of studentships for research training, it is essential that research groups have access to up-to-date equipment. With the cut-back in funding for both basic and clinical research, as well as cut-backs within University funding, coupled with an exponentially expanding technology particularly in cell and molecular biology, many units now find themselves without essential pieces of equipment. A well funded programme of capital replacement equipment is essential if researchers within this country are to remain competitive with colleagues overseas. If resources are limited, it makes good sense to concentrate these within particular areas—periodontal disease, epidemiology and community studies, dental caries, craniofacial anomalies, cell biology, molecular biology etc. within the country. Most areas of research require a team of people working in unison with the appropriate infrastructure, equipment and consumable funding.

(c) Dental research workers are constantly at the forefront of changing needs and developments in oral diseases. The research programmes conducted at the University Dental Hospital of Manchester take full cognizance of current changes in oral diseases, population parameters and developing technologies.

(d) Generally Research Councils award grants in dental research on the scientific merit of the application. It is well known that certain funding bodies have a predilection for certain types of

studies and others completely exclude certain fields. Research Councils have from time to time established research units but with little success. With the increasing limitation on funds generated from Research Councils, more researchers are turning to industry. It is not easy to extract research money from industry. Although inter relationships between industrialists and academics is a useful and welcome development, the short term "applied" nature of any research funded by the requirements of industry is being conducted at the expense of fundamental research which is traditionally the role for universities. Such a shift in emphasis augurs badly for the future for there will be a reduced fundamental base on which to spring applied research initiatives. This paucity of basic research will have far reaching implications for the future. Moreover, the paucity of funding both from the research councils and the universities means that an increasing proportion of talented researchers time is spent trying to raise funding from a variety of sources. The writing of endless grant applications, combined with site visits, lobbying, and recurrent visitations to industry, greatly limit the amount of research time available and inhibit higher thinking functions of creative individuals. The pendulum has swung too far and these activities are now a distraction from creative research rather than a stimulus. Often grants are not awarded in full or are scientifically approved but not funded. Both conditions are completely demoralising. In the former, one attempts to do a first-rate study with poor or second-rate equipment and insufficient consumable funding or manpower. The result is great inefficiency and often a second rate result. Applications which are scientifically approved but not funded lead to low morale amongst those applying. Even when successful, the cutbacks in the past few years on research studentship training, together with the poor job prospects for research scientists in the United Kingdom, means that it is incredibly difficult to recruit first-rate postdoctoral workers to any research programme. Many of the research programmes within cell and molecular biology conducted at the University Dental Hospital of Manchester rely heavily upon postdoctoral workers recruited from overseas. Such workers return home after their period of research training in the United Kingdom, but whilst here provide a very important contribution to the ongoing work. It is incredibly difficult to raise adequate funds from either Research Council or university sources for travel to scientific meetings. It must also be stated that certain areas of research are unpopular with the Research Councils, charities and industry.

(e) Research results, particularly basic research are still taking too long to be recognised. To some extent this is due to the specialised field of the scientific journals in which they are published. In part, it is also due to the world-wide increase in scientific publication, combined, in the United Kingdom, with a decreasing subscription rate to international journals by university libraries, because of the high subscription costs involved. Reading scientific journals is one of the first items to disappear when academic and research workers time is taken up with the increasing teaching and clinical loads, resulting from under-staffing, the decreased infrastructure in terms of secretarial and technical assistance and the increasing amount of time spent trying to raise research grants. Attendance at international conferences is dropping due to lack of funds for attending such conferences and the increased demands on researchers time. A method for wider dissemination of research is required.

(f) Unnecessary duplication can be reduced by funding agencies communicating more effectively with themselves. A good example in dental research is the Joint Research Committee of the Medical Research Council, the Science and Engineering Research Council, Department of Health and Social Security and the Scottish Home and Health Department. It also makes good sense for Dental Schools, Universities and Research Organisations to gear up programmes of research in specific areas and to widely publicise these within the research community. This has been the approach of the University Dental Hospital of Manchester and our research programmes are fully described in the attached brochure. By implication this means that there are certain areas of dental research, for example, research into dental caries, which are not pursued in this institution and so we avoid duplication with efforts elsewhere.

(g) The timelapse between research discoveries and clinical application in dental research is too long. This is often the result of lack of communication between research workers and clinicians, the reticence of clinicians to change standard practices and the absence of any meaningful national machinery to conduct well founded, randomised clinical trials. In many instances, however, the basic research development far outstrips the capacity, both financially and in terms of manpower, to implement such discoveries. This has certainly been true in the areas of Genetics and pre-natal diagnosis, where the availability of reagents and protocols far outstrips the number of personnel capable of implementing these, or the consumable budgets allocated by health authorities to implement them. This is a good example of the short sighted policies of cut backs in studentship training. Such individuals are required for the implementation of research findings as much as for the prosecution of future research. As most diseases both medical and dental ultimately have a genetic, molecular or cellular aetiology, it is surprising that the National Health Service does not invest more resource in this area: it is our only hope of primary prevention in the future. With such aims in mind, the University of Manchester has initiated new Honours BSc degrees in areas such as molecular biology, cell biology, developmental biology and genetics, which provide a thorough training for students in these important areas allied to medicine and dentistry. It is to be hoped that sufficient positions will be available to

enable such graduates to gain meaningful employment and so assist in the implementation of research to improve patient care or health education.

(h) More finance is required to train dental research workers—both at the PhD student and post doctoral level. Better career prospects are necessary with less emphasis on the need for clinical experience for clinical research trainees, so that more time is available for the research training. The historical grip of the Royal Colleges on postgraduate medical and dental education should be relaxed or altered to increase their research component. This is one of the fundamental differences between higher medical and dental training in this country compared to the United States. A revision of the current University funding policy is required to match such increased training developments, as there can be few long-term career prospects for scientifically trained researchers in the medical and dental fields outside a university, hospital or industrial environment.

(i) The Research Councils should be allocated more funds specifically for training fellowships in dental research. A well organised annual competition for new items of equipment must be implemented at a national level either within the context of the Research Councils or the universities. This is essential if British science is to remain competitive and at the forefront of advances in the medical and dental fields. Greater cognisance must be taken of the fact that new technologies in molecular and cell biology are expensive and change rapidly. This means that requests for new equipment items must be viewed sympathetically. An expansion of PhD studentships, intercalated BSc awards and postdoctoral fellowships is necessary in order to ensure a cadre of adequately qualified personnel to conduct future research and to implement the findings of current research. If it is the Government's intention that industry should fund Blue Skies original research as opposed to short term targeted applied technological research, then the Government must provide the necessary financial incentives for industry to be so charitable. This may be in the form of advantageous tax write off's such as exist in the United States. Without this the intention that industry should fund more basic research will be completely unrealised. Given limited resources, it is essential that research efforts are concentrated and not duplicated or conducted inefficiently due to lack of equipment, infrastructure and research personnel. Funds should be made available to fund all highly rated grant applications. The current peer review system probably provides the best judgements on the quality of work proposed. Lastly, despite the overwhelming success of the National Institute of Dental Research in the United States of America (which is part of the National Institutes of Health Programme), the high prestige of the National Institute for Medical Research (which was set up as the British analogue of the NIH) it is surprising that no effort has been made to set up a National Institute of Dental Research in Britain. It is strongly recommended that such an institution be established, preferably regionally rather than within London. This institute should be extremely well funded and should conduct both basic and clinical research. It will be essential that it is integrated into a conducive scientific and clinical research milleau, preferably by association with one of the universities. It is equally important that the institute is well funded for staff positions, equipment and recurrent consumable funding. Because of the depletion and under investment in British dental research, it will be necessary to staff such an institute, at least initially, by recruiting back to the United Kingdom those numerous talented individuals who have left to take up posts overseas. Although this will involve high initial finance, the long-term advantages will be enormous. It should be emphasised that if this institute is to be established, then it must be established on a sound financial basis—anything less will undoubtedly lead to failure.

We trust that you find these comments useful. If I can be of any further assistance, please do not hesitate to contact me.

Professor Mark W J Ferguson
April 1987

UNIVERSITY OF MANCHESTER
DEPARTMENT OF CELL AND STRUCTURAL BIOLOGY

Chairman of Department: Professor Mark W J Ferguson

Formed in a reorganisation of Biological Sciences at the University of Manchester in October 1986, the Department has drawn staff from the previous departments of Anatomy, Bacteriology & Virology, Basic Dental Sciences, Botany, Chemistry, Immunology and Medicine, who, together with some new appointments, make up this large Department consisting of 90 academic and research staff, 60 technical and secretarial staff and approximately 70 postgraduate students. Mark Ferguson (Professor of Basic Dental Sciences) is Chairman of Department and there is a small Departmental Executive Committee (Professors Cutter, Ferguson, Gosling, Harris, Hutchinson, and Scott) who formulate and agree major policy decisions. The department has considerable research grant income from Research Councils, Charities and Industry, totalling approximately 3 million pounds. This ensures a lively atmosphere, state of the art equipment and a critical mass of personnel.

The research interests of the Department of Cell and Structural Biology range from fundamental mechanisms of cell growth, physiology and differentiation, to the integration of cell behaviour in morphogenesis, development and the maintenance of adult form (including cell-cell and cell-matrix interactions), to the structure, growth and integration of tissues and physiological systems in both eukaryotes and prokaryotes, plants, animals and fungi, normal and diseased states. Interest consequently extends from the medical on the one hand to the horticultural on the other.

These wide research interests within the Department are organised into a series of interrelated themes, which are conducted within the context of seven research groups.

1. Animal (and Human) Reproduction, Development and Growth

Studies in this group are aimed at an understanding, ultimately at the molecular level, of fundamental processes in those biological systems that are not regulating to attain short-term homeostatic control, but rather are evolving and changing. Such systems are best exemplified by tissues during development, but some normal adult tissues also show long term, often cyclical, changes. These systems are obviously altering in ways that are, in the long term, rigidly regulated and controlled for the organism as a whole, but they share many crucial features with neoplasia where changes are no longer under strict control. Cancerous and pre-cancerous conditions are therefore also subjects of active investigation in this group: the interplay within the group between studies on normal and abnormal development and carcinogenesis is of benefit to both.

Current research projects include immunological responses to coitus, fertilisation, and implantation; and spermiogenesis in a range of fish, reptiles and birds. The mechanism of sex determination in the stages between the fertilized egg and organogenesis is being studied in a particularly advantageous model, the American alligator, where the sex expressed is dependent upon the incubation temperature. The mechanics of how morphological changes are accomplished in development are being studied experimentally in the now classic systems for investigating cell-cell and cell-matrix interactions in development: the vertebrate neural crest, the palate and the dentition. Further detailed insight is gained by comparison of homologous processes in reptiles, aves and mammals (both placental and marsupial). These investigations focus directly on the macromolecules of the extracellular matrix (collagens, fibronectin, laminin, proteoglycans) and on specific cell adhesion molecules. In addition, the developmental roles of: growth factors such as EGF, TGF, and B & oncogenes are being studied in a way that extends past their functions in growth control, to cover broader aspects of their influence on cellular synthetic activities, especially synthesis of matrix macromolecules. Investigations into neoplasia of the breast and mouth follow similar strategies, emphasising the parallels between cell-cell and cell-matrix interactions in carcinogenesis and development. Specific studies focus on fetal and adult fibroblastic cell lines in the process of transformation, and the role of soluble factors in the control of fetal to adult cell transitions. The roles of soluble factors and the extracellular matrix in embryonic and adult wound healing are also being investigated by a variety of *in vivo* and *in vitro* experimental strategies. In all these systems, not only are extracellular effects on differentiation being assayed but also the intracellular second messenger systems they trigger are being elucidated. Studies of intracellular calcium, PH, PI turnover and cyclic nucleotides are conducted especially to investigate stimulus-response coupling in pancreatic islet and thyroid cells. The development of the dentition lends itself not only to study at the tissue, cellular and molecular levels but also to theoretical modelling as an example of pattern formation. The relatively simple jaw arch and dental type of Crocodilians is thus the subject of mathematical analysis to discover the basic rules governing the establishment of the observed pattern of tooth initiation, replacement and form.

Several aspects of mammalian homeobox genes are currently being studied; these include, elucidation of the function of these genes in the control of embryonic pattern formation, identification of homeobox gene regulatory elements and their corresponding trans-acting factors, and analysis of RNA processing mechanisms. Embryonic pattern formation is also being studied in the developing vertebrate limb where the novel technique of cell surface chromatography is being utilised to identify different cell populations in early stage limb buds. This technique is also being used as a basis for studies on the identification of genes involved in cell differentiation and cell-cell recognition in slime moulds.

The group enjoys a wide range of facilities for microsurgery, organ and whole-embryo culture, with particular expertise in cell culture on biologically relevant substrata such as hydrated collagen gels, fibronectin etc. These cultures are analysed by phase and fluorescence microscopy, and with time-lapse videomicrography. analytical tools available include FPLC, HPLC, 1 and 2-D microgel electrophoresis, monoclonal antibody production, immunocytochemistry, light and electron microscopy (including cryoultramicrotomy, immunoelectron gold labelling, EDAX, SEM and TEM), coulter cell counters, and scintillation and gamma counters, image analysis and autoradiography. In addition to normal laboratory animals (chickens, quails, mice etc.) the group maintains a unique breeding colony of marsupials (invaluable for experimental studies at stages when placental mammals are inaccessible for manipulation) and also regularly imports live fertile alligator eggs.

The group enjoys excellent international, national and local collaborations for example with other departments (both within the University and at UMIST) with the neighbouring Paterson Institute for

Cancer Research, ICI, Colgate-Palmolive, the University of Oxford, the Institute of Cell Biology, Copenhagen, the NIH Bethesda, the University of Southern California and the Max-Planck-Institute fur Entwicklungsbiologie, Tubingen. Substantial external research funding comes from the Medical Research Council, Wellcome Trust, Cancer Research Campaign, Science and Engineering Research Council, Birthright, Action Research for the Crippled Child, Nuffield Foundation and local health authorities.

2. Chemical Morphology

This group is funded entirely by the Medical Research Council and has interests in the ultrastructure and function of connective tissue. The investigations fall into two categories, (a) the relationships between proteoglycans and collagen fibrils in tissues, and (b) the presence of secondary structures in the glycosaminoglycan sidechains of the proteoglycans. The existence of specific interactions between three types of proteoglycan and Type I collagen fibrils in a variety of tissues have been demonstrated and the first map of binding sites for proteoglycans on the collagen fibril has been drawn up. These investigations required the development of new ultrastructural methods, based on electron histochemistry and biochemical morphometry.

3. Contractile and Excitable Tissues

Research within this group is concentrated on the structure, chemistry and morphometry of muscle tissues at the light and electron microscope levels. Interest centres around two areas. The first relates to the muscles of the genitourinary tract and pelvic floor, whilst the second relates to skeletal muscles in general. Human disease states such as incontinence and muscular dystrophy are investigated in both experimental models and by analysis of human biopsy specimens. In the latter case important clinical collaborations exist, and the group services the large North West Regional Muscle Service which now has a large collection of carefully documented muscle pathologies.

4. Experimental Neurology

The main research activity of this group is directed towards investigation of the underlying brain mechanisms which are involved in the production of disorders of movement (dyskinesias) in diseases of the central nervous system. Of particular interest are dyskinesias related to basal ganglia disease. The disorders currently under investigation include Parkinson's disease, drug-induced dyskinesias, Huntington's chorea, athetosis, dystonia and hemiballismus. The research approach is multidisciplinary, employing the techniques of experimental neuroanatomy, neurophysiology and neuropharmacology. The work is of considerable direct clinical and social relevance since at least 70,000 people suffer from Parkinson's disease in Britain alone. There is close research collaboration with the Department of Clinical Neurology at the University Hospital of South Manchester and with the Department of Physiological Sciences. The work of the group is well-funded from external sources like the Medical Research Council and The Wellcome Trust.

5. Immunology

A congenitally athymic rat model is being used to examine the development and maturation of T cells outside the thymus, their long-term survival and the subpopulations of T cells which cause graft rejection. The interaction which occurs between lymphocytes and specialised endothelium is also of great interest since it determines the ability of lymphocytes to recirculate and is also fundamental to understanding the inflammatory process. Culture of lymph node endothelium in vitro has opened up a new means of investigating lymphocyte/endothelial communication by studying the physiology of these specialised cells. Lymphocytes in the blood migrate selectively to lymphatic tissues and this is being exploited for clinical purposes, to transport radioisotopes and toxins (for example, ricin) into spleen, lymph nodes and tumours of lymphatic origin. In order to better understand the immune response in vivo, we are studying the cellular events within the microenvironment of the spleen by using cells to transport antigen selectively into one or other compartment. Parallel studies in man and animals are underway to explore the underlying mechanisms of clinical allergy with an eye to developing novel methods of treatment. This project is also investigating the origin and functions of two distinct mast cell populations. Study of the immune response to small peptides is developing a means of augmenting immune responses to synthetic peptide vaccines using novel carrier systems and is aided by computer modelling to predict antigenic regions of importance. External research grant income to this group derives mostly from the Medical Research Council.

6. Microbiology

Research within this group falls into five major areas.

(i) Various aspects of the microbiology of dental caries including studies of: mutants of *Streptococcus mutans* differing in their adhesive properties, their extracellular matrix production and cariogenicity; the structure and macromolecular organisation of the extracellular products synthesised by cariogenic bacteria; the immunolocalisation of cell surface determinants and their relationship to bacterial adhesion; use of continuous culture systems to determine relationships between environmental factors and expression of cell surface determinants.

(ii) Research in plant pathology includes studies of the physiology and cytology of bacterial diseases of tobacco, apple, pear and hawthorne, including strategies for their control; evaluation of

biological control agents for bacterial diseases of crops; resistance of fungal pathogens to fungicides; improvements of macropropagation of woody ornamentals by control of fungal diseases; virus infection, and virus diseases of celery.

(iii) Studies of methods of syphilis diagnosis; serological techniques; immunodominant antigens of micro-organisms; aminoglycoside antibiotics; and influenza virus. Studies of drug resistance in pathogenic bacteria and on the resistance of bacterial spores to physical and chemical agents; the germination and outgrowth of bacterial spores. Sterilisation and decontamination technology.

(iv) Physiology and developmental biology of fungi, featuring studies of: the use of fermentation systems to produce biomass and secondary metabolites, fungal spores, and single cell protein; the cytology and physiology of rumen fungi; the mode of action of antifungal agents; the metabolic roles of developmentally-regulated enzymes and their function in differentiation of the developing fruit body of *Coprinus* and other basidiomycetes.

(v) Biology of micro-organisms in the environment, including studies on freshwater phytoplankton and the role of bacteria and algae in marine corrosion of steel. Cytological aspects of cell differentiation in the mushroom.

The group collaborates with industry (ICI, Shell and BP), research institutes (Animal and Grassland Research Institute and Glasshouse Crops Research Institute) and dental colleagues; external grant funding is derived from the Medical Research Council, The European Economic Community, the Agricultural and Food Research Council, Science and Engineering Research Council and Agricultural Genetics Company Ltd.

7. Plant Science and Cytogenetics

In Cytogenetics, interests centre on patterns of chromosomal evolution, reflected by changes in molecular organisations, pairing behaviour and recombination frequency, and synthesis of translocations for use in biological control programmes. Current projects, some of which are supported by the Science and Engineering Research Council, International Atomic Energy Agency, Food and Agriculture Organisation and World Health Organisation, include studies of primitive green plants, cereals, grasses, legumes and insect pests. Of special interest are: patterns of structural organisation in chromosomes of liverworts and mosses; mechanics of chromosome behaviour in natural and experimental polyploids; genotype-environment interaction in dihaploid barley and apomictic grasses; evolution and uses of aneuploid markers in arctic-alpine and forage grasses; ovarian development, female meiosis and fertility in insects; cytoplasmic control of swarm-phase morphology in locusts and grasshoppers; engineering of radiation-induced chromosomal re-arrangements for control of onion fly, cabbage-root fly and Mediterranean fruit fly.

In Plant Physiology, biochemical work involves investigations into the role of the root plastid in the integration of nitrogen and carbohydrate metabolism in the higher plant root and the mechanisms involved in the interactions of cations, including heavy metals, with cells and organelles. Whole-plant studies include the photocontrol of plant development with special reference to anthocyanin biosynthesis and germination of light-sensitive seeds. Special attention is being given currently to the biochemical and physiological responses of plants to stress. Current projects are concerned with the selection of submergence-tolerant varieties of deepwater rice, the effect of low temperature stress on ion transport and membrane properties of rye roots, photosynthetic responses to high temperature stress in wheat cultivars, the basis of salt-tolerance in *Lemna*, atmospheric nitrogen deposition and photosynthesis in aquatic bryophytes, the water relations of plants showing crassulacean acid metabolism, and the ecophysiology of tropical alpines.

Studies of Plant Development include the developmental morphology of the flowers, inflorescences and ambiguous structures in helobial monocotyledons, and the statistical analysis of patterns of stomatal differentiation in leaves of monocotyledons; control of the development of tuberous roots in cassava, investigated by means of tissue culture; response to gravity and the elongation of cultivars of deepwater rice; to study the control of phase change in ferns, aposporous and apogamous ferns are being studied with SEM and TEM, and gel electrophoretic studies are contributing to the characterisation of proteins in ferns.

Central Facilities

Cell & Structural Biology also administers a number of central facilities on behalf of the School of Biological Sciences including an Electron Microscope Unit (which houses 12 Transmission Electron Microscopes, 2 Scanning Electron Microscopes, including high resolution machines, a dedicated electron probe, a full range of elemental analysis and low temperature equipment), the Experimental Botanical Grounds (about 10 ha of space for field experiments with extensive glasshouse facilities). Photographic Services and a centralised washing-up, sterilisation and media-preparation facility.

Letter from University of Newcastle Upon Tyne, Department of Child Health

I would like to submit the following comments on this subject. I work as a temporary Senior Lecturer in Epidemiology in the Department of Child Health on a five year project funded by the Gatsby Foundation (Sainsburys). I qualified nearly twenty years ago and since then I have spent something like seven years in research into various aspects of childhood handicap funded by a variety of bodies before I started this present project about eighteen months ago.

The programme on which I am now working is to develop measures of child health in a local community of some 700,000 population resident in three health authorities. We have defined a number of weaknesses in present sources of information concerning child health for each of which I have written research protocols which have either been funded or are pending funding from a variety of voluntary and statutory bodies.

The reason we have decided to concentrate on the issues of measurement of child health is that, at present, beyond mortality we have very little reliable information about the health of the community. Such measurements of health are however vitally important to the proper allocation of resources for health care and this issue becomes ever more pressing as resources become constrained. One might well ask how it is that we are only now addressing the question of how to measure health for this purpose and it seems that the reason is a combination of two historical factors. Firstly, there has been a bias towards the provision of service on the basis of "need" as defined by the demand which patients make on doctors. This direction of medical resources has been further biased by the influence of certain groups of doctors with a special expertise or interest. There has rarely been any perception of medical responsibility for whole populations on the part of those (more politically powerful) doctors working in hospitals.

To answer the particular points you require evidence on:

1. *How are priorities for medical research set? How do these reflect the particular needs of the National Health Service or, more generally, the health needs of the whole nation?*

I believe we don't know the "health needs" of the nation. Most so-called evidence of health need is actually based on statistics of health service activity rather than any direct measurement of community health status.

2. *Is the present balance between different branches of research right? Assuming that resources are limited, what programmes might be cut back in order to allow those that should be given a higher priority to expand? What programmes need higher priority? Would priorities change in the light of increased resources?*

I believe that the balance of resources must be directed towards the following fields:

(a) the efficiency of alternative methods of care,

(b) the generic measurement of health (that is, comparable across different conditions),

(c) the expansion of preventive medicine,

(d) the relief of chronic disability and handicap in the community.

Those programmes that should be cut back are those largely ineffective attempts which are made to prolong adult life by replacement or reparative surgery and medicine after preventable chronic disease processes have become established. Examples of this are, heart transplants, coronary artery by-pass grafting, surgical treatment of various cancers, a good deal of pharmaceutical research and medical treatment of various other kinds.

The second group of research activities which should be limited are those which use very expensive pieces of medical equipment or medical techniques. It is clear that such "high technology" research will increasingly need to be concentrated in one or two sites as a controlled form of research and development before service implementation.

The last form of research which is attracting increasing resource with diminishing returns is the intensive care of humans at the extremes of life (that is, neonatal and geriatric). In a rampantly fertile society, the question must be asked whether it is defensible to divert resources away from other forms of research towards the preservation of "life" without qualification.

3. *Are priorities in medical research adapting to changing incidences of disease, changing population structures, and new technology?*

The answer as outlined above to this must be no. We must be moving towards more prevention of modern Western diseases before they become established particularly cancers, ischaemic heart disease and various respiratory diseases.

4. *How are priorities in medical research influenced by institutions through which research is funded? How does the balance between public, commercial and charitable funding of research affect the setting of priorities by the different institutions involved?*

Charities are better endowed for the more "popular" medical conditions. Some Cinderella conditions, for instance, mental handicap, chronic physical handicap, childhood accidents, medical information studies are grossly under-funded at the expense of cancer, heart disease and transplant surgery.

5. *Are the results of research adequately disseminated?*

Yes.

6. *How is unnecessary duplication of research effort avoided?*

I don't believe this is a problem.

7. *Is research reflected as it should be in actual improvements in patient care or health education? If not, why not?*

In general, I feel that the answer to this is no and it is because of the absence of a second generation type of research dedicated to problems of implementation of established good practice.

8. *What changes in the priorities in the training of medical researchers are needed?*

I believe this is one of the most important issues as there is, at present, very little in the way of an organised training or career structure for medical researchers. I speak from personal experience in saying that much medical research is conducted by people caught in a vicious circle where:

(a) in order to secure funding, researchers undertake to provide maximum results with minimum resources,

(b) there is a complete absence of training in core subjects such as computing, statistics and even in basic literacy (such as reading skills, use of library, critical thought and presentation of material, either written or verbal).

(c) The last year of the project (which is usually funded for three years or less is spent desperately preparing protocols for the next grant application and regretting the fact that insufficient time was allowed for analysis and writing up the original research protocol.

I believe this kind of research environment leads to a prodigious waste of research taken and a good deal of unnecessary anxiety amongst young researchers. The best research is surely done by young people in a supportive environment which gives them training in the basic skills for their work without unduly directing the actual content of the research work. There is no doubt that some young medical "researchers" will turn out not to have the necessary talent but this cannot be made the excuse for the lack of proper training or career structure any more than in other forms of medical practice.

9. *Should any specific changes in organisation or funding be made in order to increase the quality, quantity or application of research?*

The single most important issue, as I have outlined above, is the question of developing a proper career structure and training. I feel a separate enquiry into this particular aspect is needed.

I hope these comments are useful to your committee.

Dr S Jarvis

May 1987

Letter from University of Southampton, Faculty of Medicine

We would like to make some comments to be considered by the Select Committee on Science and Technology. We are faculty members of the University department of Primary Medical Care and are engaged in a variety of research activities related to general practice. These fall, broadly, into two groups. Firstly, we are undertaking experimental studies on the delivery of care to patients with debilitating disorders; we are evaluating the process and outcome of introducing structured care for diabetes and asthma into general practices and studying the contribution of nurses at practice and district level (primary care facilitators) to this care. We are also studying opportunistic screening strategies for identifying at-risk groups among the elderly and the changing role of the personal doctor and the importance of continuity of medical care in modern general practice. Secondly, we are conducting surveys and clinical trials in the natural history and rational treatment of a number of common conditions, including upper respiratory tract and middle ear infections, asthma, perennial rhinitis and dyspepsia. These studies, which

often involve repeated measurements on patients, are uniquely suited to the primary care setting with its ease of accessibility and strong doctor-patient relationship over time.

We write to emphasise the importance of this clinical and operational research to the National Health Service. Ninety per cent of illness presented to physicians is dealt with by general practitioners, with secondary and tertiary (hospital) care dealing with only a small proportion. Many of the current descriptions of disease and recommendations for management stem from studies performed on selected populations by specialists in hospital settings and only gradually are these being replaced by studies performed in general practice and relevant to the general population. Common acute conditions, such as otitis media, which present mainly to general practitioners, and chronic conditions such as asthma, hypertension and diabetes, where the numbers of patients involved make hospital supervision of all but a select few impossible, are particularly good examples of where research effort in primary care is likely to provide information which will both reduce morbidity, for example, from childhood deafness and adult blindness and also clarify efficient use of National Health Service resources in both primary and secondary care. These benefits to secondary care are likely to be further enhanced by the evolution of effective primary care screening strategies, for example, paediatric surveillance, identification of coronary risk factors and the health needs of the elderly.

With reference to the specific questions on which evidence is required, we believe (q. 1 & 2) that *there is a serious imbalance between the provision of research resources for primary care and the biomedical research which characterises secondary care*. This may stem from a misperception of the importance and potential of primary care research and of the intimate and often reciprocal relationship in terms of medical workload between the two settings.

Following on from this (q. 3) the use of appropriate technology, such as microcomputers and solid phase biochemistry, will contribute to the ability of primary care physicians to manage patients without recourse to hospital referral and these developments require research evaluation.

Funding research in primary care (q. 4) poses specific problems since many grant-giving institutions remain attuned primarily to biomedical research in hospital laboratories and the importance of clinical and operational research and the evaluation of novel systems of delivery of care within general practice are not well appreciated. These imbalances are often reflected in the composition of grant committees in public, voluntary and private sectors. Conversely, commercial funding for primary care research generally implies pharmaceutical industry support, and projects without an evident pharmaceutical focus may not be easy to fund.

The results of research in general practice (q. 5 & 6) are reasonably well disseminated; publications in the UK are restricted to a small number of journals—the Journal of the Royal College of General Practitioners, the British Medical Journal and Family Practice. The Royal College of General Practitioners, together with the General Practitioner Research Group, publishes "Research Intelligence" which is a cross-referenced index of GP researchers in the United Kingdom. The academic general practice community meets regularly, nationally and regionally, as the Association of University Teachers of General Practice.

Much research in general practice (q. 7) has had direct beneficial effects on patient care, via the organisation of systems of care and the development of improved therapeutic and management approaches. There are many examples of this, ranging from the use of single dose and short-course antibiotic treatments for urinary tract and middle ear infections, improvements in the care of the dying, changes in obstetric practice, better management of ischaemic heart disease, hypertension and asthma, developments in note-keeping and practice organisation and in approaches to surveillance and screening.

Research in general practice (q. 8) remains a minority activity. Although it is a recognised part of the work of general practitioners working in the university departments, for the "service" general practitioner the pursuit of research activities is almost always unsupported and requires expenditure of time and effort beyond the normal commitments of day-to-day general practice. Because GPs do not have junior staff to cover absences from clinical work, research activities within the practice must, at present, always take second place to patient care, yet valuable research is coming from NHS GPs, for example the recent important publications from Essex and Hampshire on the possible aetiology of multiple sclerosis. Whilst research funding is, often with great difficulty, available at a level sufficient to permit enthusiastic researchers to pursue their interests, the additional provision of Family Practitioner Committee or postgraduate training funds to facilitate the pursuit of research projects by GPs would enormously enhance their potential contribution.

Finally (q. 9), we believe that funding for the kind of studies mentioned above should be made more readily available for primary care research, and that a mechanism should be introduced to permit doctors in NHS general practice to follow research directions without jeopardising their practices' ability to provide adequate patient care.

We conclude that the imbalance between funding for primary and secondary care research requires urgent readjustment. This could be achieved by making research fellowships, training courses in research methodology

leading to higher degrees and extended leave from clinical commitments available to all general practitioners. Only by doing this can general practice establish and enhance its own research tradition and structure and address itself, energetically and authoritatively, to questions which are fundamental to the future of the National Health Service.

John Bain, MD PhD, FRCGP
Professor

George Freeman, MRCP, FRCGP
Senior Lecturer

Roger Jones, MRCP, MRCGP
Senior Lecturer

David Jewell, MRCGP
Senior Lecturer

Charles Freer, M Cl Sc, MRCGP
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Ann-Louise Kinmonth, MD, MRCP, MRCGP
Senior Lecturer

Peter Burke, MRCP, MRCGP
Senior Lecturer

April 1987

Letter from University of Strathclyde, Department of Physiology and Pharmacology

The Principal has asked me to reply on his behalf to your letter of 5 March 1987. I therefore submit the following views from the University for consideration by the Sub-Committee of the House of Lords Select Committee.

CURRENT INVOLVEMENT IN MEDICAL RESEARCH

The University of Strathclyde has a considerable expertise in basic medical sciences, and regards its research in these fields as one of its priority areas for selective development. The departments concerned are in the process of being organised into an Institute of Medical Sciences which includes our School of Pharmacy. Although the University is without a medical school, there are very strong connections at a research level with clinical departments and with the Pharmaceutical Industry in the United Kingdom and in the EEC and USA.

The over-riding (although not exclusive) philosophy is that the research be applied and in response to a clearly seen need of the community, and this is our main priority, in allocating resources. Hence, for example, we are particularly concerned with studying the aetiology, diagnosis, and therapy of diseases associated with ageing, especially those associated with the cardiovascular system and brain or which include an aspect of immune incompetence. The attached case report from a recent British Medical Journal is merely one illustration of our collaborative approach with clinical medicine (although it happens, I believe, to be the first reported use of a monoclonal antibody for imaging a tumour). An illustration of our interaction with the pharmaceutical industry is the fact that the University (via the Department of Pharmacy), jointly with the Wellcome Foundation, won the Queen's Award for Technological Achievement for the design and development of the new neuromuscular blocking drug, atracurium, which is contributing substantially and beneficially to the nation's balance of payments. There are many other examples, and as a consequence our medical sciences are well supported financially by the Pharmaceutical Industry and the relevant charitable trusts.

Our medical sciences exist in two broad, though interacting, categories: *Bioengineering* and *Drug and Diagnostic Research* and these are briefly described separately below.

Bioengineering

The Bioengineering Unit undertakes research in collaboration with clinical groups by mutual invitation and agreement. The unit is presently involved with ten different clinical groups in the City of Glasgow, at least four others in the United Kingdom and six in overseas countries. The activities of the Unit are in two principal categories. The first is the measurement of physical parameters relating to human function in health and disease, for example, the loads developed at joints in the body and the load actions developed in the long bones during normal function; the deformability of red and white cells and the consequent viscous flow parameters related to perfusion of the microvasculature; the effects of materials utilised in extracorporeal blood circuits on the clotting cascade, complement activation and other factors; the mechanics of the environment, and the effect of drugs or other treatments on these patterns for the disabled. The second area of activity is the development of methods of treatment for patients with specific diseases or disabilities: examples include design of joint replacement implants; the development of systems of functional electrical stimulation for patients with spinal cord injury and other patients suffering from neurological deficits; the development of lasers for use in the removal of skin markings and as an adjunct to vascular surgery.

Drug and Diagnostic Research

The departments of study involved in this research are Immunology, Cell Biology, Organic Chemistry, Physiology & Pharmacology and Pharmacy. It is not reasonable to list all of the research projects that are currently underway, and the following examples will suffice: The development of medical diagnostics for self monitoring and diagnosis, hopefully to relieve pressure on the NHS. Research into the production of human monoclonal antibodies for treatment of rhesus disease of the newborn. The development of monoclonal antibodies for cancer therapy, for the imaging of tumours, and for the imaging of cardiac infarcts. Experimental myocardial infarction and drug-induced modification of ischaemic damage. Early life-threatening cardiac arrhythmias and their modification by environmental and toxicological hazards (for example, alcohol and heavy metals); their control by drugs. Endogenous mediators in endotoxin and septic shock. New anti-arrhythmic drugs and inotropic agents; their mechanisms of action. Inflammatory mediators in inflammatory joint and bowel disease. Properties of cell membranes in developing human and animal nerve and muscle cells in culture; effects of receptor antibodies and of various growth stimulants. Membrane events and second messengers in smooth muscle function (human and animal) in health and disease (hypertension, asthma); modification by drugs. The control and drug modification of transmitter release at central and peripheral synapses; the role of cotransmitters. A search for drugs that modify transmitter synthesis and release in a potentially beneficial way in conditions such as Alzheimer's disease. A search for useful types of drug action in newly discovered venoms and toxins, the possibility of utilising recombinant DNA technology to induce the development of the pure fraction in micro-organisms, the discovery of the active pharmacophore, and the subsequent synthesis of simpler active molecules. Factors controlling carbohydrate metabolism, especially in relation to pertussis infection. The development and application of methods for the standardisation of drugs and medicines, and to their measurement in biological systems. Pharmacokinetics and drug metabolism studies in relation to ageing and disease states. Drug targetting and optimisation of formulation, especially in relation to anti-cancer drugs. Mechanisms of action of antimicrobials and of resistance to them.

Answers to specific questions

(a) Priorities for current research in Bioengineering are established in discussion with collaborating clinicians and taking account of the information acquired by senior members of the Bioengineering Unit who participate in the activities of Review Committees of grant-giving bodies. Likewise in the basic medical sciences, priorities are partly established in discussion with collaborating clinicians, but also by the approach of industrial colleagues who actively seek our existing expertise.

(b) It is desirable that the priorities in research at the present time be set, taking account of matters at the forefront of public interest, and also of the fact that new developments frequently arise from extensive basic ground work undertaken in unspectacular research areas. The areas of major public interest are those likely to result in premature death or disability, for example, cardiovascular or neurological or traumatically-related disabilities occurring in the population below the age of 50. In the same way the increasing number of the population surviving well beyond normal retiral age poses problems in maintaining the quality of life for them in the face of mental degeneration, joint disease, cerebral and vascular disease, chronic inflammatory diseases, certain kinds of tumour, and the problems associated with ageing muscle. The programmes relating to the treatment of the ageing population need higher priority, although they are not popular research areas. An increased availability of resources for these research areas might encourage research concentration.

Improved methods of diagnosis and therapy will be necessary if we are to have any chance of limiting the increasing burden of an ageing population on the health care services. With many of these diseases, we are on the threshold of understanding the disease mechanisms in a way that we have not been during the past 50 years. A concerted research investment initiative now would produce major successes in many areas. It should also save the government vast expense over the next 20 years in reducing the burden on the health care services.

(c) Priorities in medical research do seem to be adapting to change and new technology, but slowly, and against a background of strong lobbying for certain "pet" areas.

(d) The SERC in its medical engineering programme has certain defined specially promoted programmes, and grant applications for research in these areas receive a major preference. Similarly, the MRC makes additional funds available for specific areas from time to time. The funds available for charitable foundations depend critically on the volume of support which they receive from the public. These three factors have an influence on research directions in particular laboratories, but it must be said that the effects are slow-acting and long term, largely due to the fact that research is undertaken by individuals within programmes who have specific skills from their first and early training which are relevant to certain research areas only. It is not a satisfactory situation that charitable bodies support the bulk of medical research. Industrial support is of course restricted to commercially attractive fields, and this is also unsatisfactory.

(e) It is commonly contended that there is excessive publication in professional journals related to the promotion prospects of junior staff. However, since much medical research currently is the

result of multidisciplinary collaboration, it may be that the findings are not adequately reported and interpreted in the journals corresponding to the individual disciplines. One major factor relating to dissemination of research results is the delay occasioned by the reviewing and printing procedures of the well-established journals.

(f) It is often contended that any duplication of research effort is unnecessary and this is anything but true. It is important that researches should be open to the challenge of comparable work being done by other means in different laboratories so that differences in interpretation may be made. In these circumstances the confirmation of findings is doubly valuable. In the United Kingdom the volume of experts in particular fields is such that applications, even although directed to different funding bodies, will frequently cross the desk of the same reviewer. This is a valuable means of avoiding unnecessary duplication. There may, however, be scope for more effective communication between the relevant Research Councils, DHSS and SHHD, and the committees of charitable foundations.

(g) Some research findings in the field of new drugs take a long time to result in improvements in patient care or health education because of the requirement of extensive toxicity testing in animals, tests that are often of doubtful relevance to man. Clinical trials of long duration are also often required. Such trials are frequently very difficult to undertake since commercial companies are rarely willing to give continuing support without the prospect of early financial returns. Discussions with merchant bankers have also revealed that they are largely unaware of the problems related to clinical trials.

(h) Increasingly, medical research is depending on advanced technologies and much greater emphasis should be placed on collaborative research between people with education in medicine, basic biological sciences, physical science, and also in technology.

(i) As previously mentioned, provision of facilities for collaborative research would be a welcome change in organisation, and also more flexible funding to allow long term clinical trials, would assist the effective application of research.

Professor W C Bowman
Deputy Principal

April 1987

Letter from University of Wales, College of Medicine, Dental School

I have received a copy of a letter dated 16th March, 1987, which you wrote to Mr N Davies, Registrar of the General Dental Council. This has subsequently been discussed at our Heads of Departments meeting and we would like to make the following comments in the same order as they appear in your letter.

(a) The MRC has in the past attempted to dissect priorities for dental research through its dental committees. However, there are deficiencies in the volume and quality of research into oral disease which affect only a minority of the population, for example, the one thousand people who die of intra-oral cancer each year for whom the prognosis has not improved in the past 25 years, compared with the greatly increased five-year survival rate registered in diseases such as Hodgkin's disease which generally attract more publicity.

(b) We question that resources are limited as is assumed here, and we think the fund for dental and medical research should be expanded. Research into oral cancer needs a higher priority. The funding for molecular biology in relation to dental research should be deliberately increased.

(c) Oral and dental research has not taken advantage of the new technology available, particularly in molecular biology.

(d) If a stable funded base is not maintained in the public sector, the foundation is not available from which to seek commercial or charitable funds.

(e) The results of research are adequately disseminated by journals, although due to the proliferation of these it is harder and harder to keep up with the literature.

(f) Reviewers of grant application and of publications in journals are the main agencies for preventing duplication of research effort.

(g) No comment.

(h) It would be helpful if junior members of staff, having achieved a Fellowship and were in a position of entering the senior registrar grade, could be given time off to undertake a full year of research training prior to starting a PhD or a DChD.

(i) More finance is certainly required, but we are not convinced that one can actually plan a programme and set priorities in medical research. Priorities can be set, but it does not follow that the necessary ideas and technology is available to answer a particular problem.

N R E Robertson

June

Memorandum by University of Wales, College of Medicine, Department of General Practices

This Department has been increasingly involved in both basic and applied research for over 10 years. The following areas have received special attention:

1. Clinical trials

— respiratory infections

— urinary infections

— hay fever treatment

— asthma treatment

— hypertension treatment.

2. Health beliefs and behaviour: particularly in relation to prevention, health promotion and screening.

3. Evaluation of the use of health education leaflets.

4. Investigation of the epidemiology, natural history and complications of:

— the urethral syndrome

— upper respiratory infections in children.

5. Provision of services for:

— care of the dying

— developmental surveillance.

6. Teaching methods for undergraduate students.

All this work has been funded by grants obtained from official grant-giving bodies or, in the case of clinical trials, from pharmaceutical companies.

Specific Questions

(a) The setting of priorities for medical research is usually the result of two sets of forces:

(i) the interest of the research worker;

(ii) the availability of a funding source.

Primary Health Care has close contact with the public (over 1.5 million contacts per day in the United Kingdom) and hence the interests and priorities of researchers with day-to-day experience in Primary Care are likely to be closer to problems experienced by a significant proportion of the population. The projects conducted by members of this Department in the past decade reflect how common problems have been tackled systematically rather than esoteric ones.

The health needs of the nation (and the NHS) can only be balanced if a significant amount of research is generated from Primary Health Care.

(b) It is extremely difficult to win research support for research in Primary Health Care unless it is disease or drug focussed. Likewise uncommon problems are funded for research more readily than common problems. The imbalance reflects the priority for high technology specialised targets and the failure of many grant giving bodies to grasp the importance of research into natural processes instead of interventions, using social science methods as well as the biomedical.

More resources without a shift of priorities would probably not improve the situation.

(c) Priorities in medical research in Primary Health Care do change in the light of population and disease changes because those working in the front-lines of care are constantly exposed to

numerically important issues. We also need specialised surveillance units to pick up early changes and highlight them before they become numerically important (for example AIDS) but publicity and priorities for the new can detract from numerically much more important older issues (for example nutrition, measles or life-style choices).

(d) Every applicant for research in the present climate learns that the DHSS is over committed, the ESRC has very limited resources, the HEC has gone and the HPRT is controversial with limited life expectancy. Most other bodies (even MRC) are focussed on particular conditions/diseases and few are concerned with wider issues of health promotion. Survey work and qualitative studies are increasingly difficult to fund for a mixture of the reasons given, hence over simplistic questionnaire studies are often used inappropriately because they are cheap and easy.

(e) Results of research have never been adequately disseminated for two reasons:

(i) much work is published in specialised journals and the generalist has a major task in finding it;

(ii) few grant-giving bodies will fund a dissemination phase for research, hence workers are always seeking fresh funding just at the time when they should be writing more and speaking more;

(iii) most "scientists" read selectively and, sadly, only lift what is convenient from their reading. The only way to overcome this problem is through encouraging comprehensive reviews of important topics by joint authors from different disciplines. Without this the status quo is perpetuated.

(f) Duplication of research is not necessarily wasteful because concordance of results improves validity.

(g) Built-in inertia and slowness to adopt innovation are societies defences against over reacting to each fashion or new bit of evidence. The important thing is to fund an adequate phase of dissemination of new data.

(h) Medical researchers need regular access to new techniques and developments in methodology—probably only achieveable by different disciplines running courses on a regular basis. A major gap is medical understanding of social science methods.

(i) Funding is a major problem which is frustrating and strangling many new ideas and developments. Organisation which specifically earmarks money for research in the problem areas mentioned above should yield good results.

General Comments

Primary Health Care is a vastly under researched discipline considering the current administrations commitment to increased community care. At present some excellent research is undertaken by a few dedicated people, largely as a labour of love, but proper incentives and support do not exist to encourage more general practitioners and nurses into research. A career in the hospital service encourages research up to consultant level without financial penalty or loss of status. In general practice the career structure mitigates against research because, becoming established as a principal does not demand research output. Furthermore, the only provision for research is prolonged study leave once in a career, hardly ideal to foster continuing research.

We need a new contract for doctors and nurses in community care which provides protected time for approved research without financial loss. Four ways to achieve this are readily available:

(a) by relaxing the restrictions on appointing an additional partner so a practice can carry the additional workload required of protected time available for approved research;

(b) permit greater flexibility in payment of locum fees while a doctor pursues approved research;

(c) allow an extension of the womens retainer scheme to keep women doctors in work as well as provide protected time for full time doctors to pursue research;

(d) provide earmarked money for Academic Departments of General Practice and Primary Health Care to appoint part-time lecturers in their regions and thereby encourage supervised, broadly based research in Primary Health Care. Such lecturers could come from a variety of disciplines working in community teams for example doctors, nurses, physiotherapists, psychologists, dieticians, etc.

Each of these four strategies would involve more research by people working closely with the community served in Primary Health Care. Each would also involve more supervision and support from Academic Departments of Primary Health Care if the conduct of research is to be of a high standard and relevant. For this reason the full time staff in the Academic Departments will need appropriate support which has also never been forthcoming since the inception of such Departments (see McKenzie Report 1986—attached).

Letter from Upjohn Limited

With reference to your letter of the 4 March 1987, Upjohn Limited welcomes the opportunity to make a submission to the Committee.

Upjohn Limited was established in 1952 as the United Kingdom subsidiary of the Upjohn Company (which is based in Kalamazoo, Michigan) and has been marketing prescription pharmaceutical products since that time. We started manufacturing activities in 1962 and opened development laboratories in 1967. Upjohn has also used the United Kingdom for clinical studies on a number of significant new compounds including prostaglandins, a novel class of triazolobenzodiazepines, antibiotics and steroids. Our development activities (which include formulation, drug metabolism and toxicology) have expanded steadily and about 100 people are now employed in Crawley as part of Upjohn's worldwide R&D programme. We are seeking to establish a clinical pharmacology unit in conjunction with a local hospital and exploratory talks are underway. In addition, we will be setting up discovery units in conjunction with selected centres in universities and other instiutions.

The Upjohn Company is the thirteenth largest pharmaceutical company in the world, spending 15 per cent of sales on pharmaceutical research and development so that in 1986 our Research and Development expenditure was £200 million. We have research programmes in CNS, cardiovascular, infectious diseases, cancer, virology, atherosclerosis, thrombosis and hypersensitivity diseases. We also have significant programmes in biotechnology and in all activities related to the development of new therapeutic agents (for example toxicology, drug metabolism, formulation development, drug delivery and targeting). Upjohn operates on a world-wide basis and in addition to our current research interests in the US and intention to expand in the United Kingdom and Europe, we are also expanding our R&D programme in Japan.

The Sub-Committee will appreciate from the above that Upjohn has gained some insights and experience which may be helpful. We are also very concerned that the United Kingdom has a vigorous and stimulating environment in which we can participate in scientific and clinical research and development.

We would like to provide evidence to answer the nine questions in the order set out in your letter.

(a) Upjohn sets its priorities for research largely on the basis that there is an unmet or insufficiently met medical need, on the likelihood of success and on the potential market. Thus, we address the areas of greatest medical need, on the supposition that the greatest medical needs are also likely to give rise to the greatest markets. Our aim is to ensure that any new therapy offers an advantage in terms of efficacy, safety or overall economy over existing therapy.

We are not aware of any clear national goals or priorities for medical research in the United Kingdom. This may be because there are none or because they have been inadequately communicated. Obviously, we are aware of the general needs of the NHS and the disease patterns and trends which are current and are starting to emerge. As far as we know, these are not translated formally by any government agency into a list of priorities.

(b) We do not consider the present balance to be ideal in that acute medicines receive too much attention while chronic diseases, particularly of old age, seem to be largely neglected. There is also insufficient attention given to research into clinical medicine in three major areas of NHS expense—general practice, surgery and nursing.

Preventative medicine is also badly neglected and research into cost-effectiveness of different therapeutic regimes is only just starting. Some research programmes could be seen to offer more in terms of public relations exercises than in meeting of true medical needs, (for example transplantation) where the benefits to society as a whole would appear to be relatively few.

Other programmes need higher priority, especially diseases of old age, including Alzheimer's disease and incontinence, both of which are responsible for institutionalisation of large numbers of elderly patients. There should be a programme to ensure that the elderly are able to live independently in the community for as long as possible.

(c) As stated earlier, it seems that some priorities in medical research may be set more by the extent of media coverage than by real existing need—it seems that additional funds for AIDS research was available far more easily than would have been the case for less visible diseases which may be much more important medically. Biophysical techniques are poorly applied in medicine and only used intermittently depending upon the funding of a particular area of hospital and/or the interests of the consultants concerned.

(d) The way in which funds are presently utilised seems to indicate that the areas of research are largely determined by the interests of members of the relevant administrative boards involved, whether they be research councils, pharmaceutical companies, or charities.

Charitable funding is haphazard and could be considered an anachronism in the 1980's for research into major areas of medicine (for example cancer, heart dieease). However, there is no doubt that charitable funding will continue to be essential for areas where there is a much lower

instance of disease, for example cystic fibrosis or other such diseases, which have to compete for public funding with much more visible areas and thus might never get any funding at all.

One area in which more help could be given would be to ensure that medical charities receive good value for money—it may be that the clinical and scientific people involved with these charities are too closely identified with the research and are unable to really determine whether good value for money is being received.

With regard to commercial funding; as a profit-making organisation, most of our funds must go to areas which are relevant to our current interests. It is not reasonable that we make large donations to areas in which we have no interest if only because we are unable to meet all the funding requests we receive in areas in which we have an interest.

We believe it is important that there are alternative sources of funding so that researchers are not then at the mercy of one particular decision-making body. Nevertheless, it does mean that funds are not always being targetted as well as they might and relationships on funding between the MRC, NHS and the universities are not clear. There is also a gap, now being bridged to some extent, between the MRC and the SERC, which means that work which falls at the boundary of the responsibility of the MRC or SERC may have difficulty in being funded.

(e) We feel that there is adequate dissemination of the results of research—in fact there is an information overload so that it is difficult to pick out the most significant papers. It is difficult to see any realistic way in which matters may be improved without a fundamental change in the way in which scientific publication is managed.

(f) Duplication of research effort is rarely a problem—in fact one problem is that too few experimental results in the clinical area are subject to independent repetition and verification.

The pressure on individuals to publish in order to ensure continued receipt of research grants may mean that the work in progress must be reported frequently and before significant results have been established.

(g) Anecdotal accounts and straw polls by newspapers etc. would seem to indicate a lowering of standards in patient care as reflected by waiting lists, quality of nursing, travel distances for patients and their relatives. There appears to be an increase in post-operative infection perhaps due to an over reliance on antibiotics.

The improvement in health of the population is very largely confined to upper income groups and the gap between the health of upper and lower income groups appears to be increasing.

The incidence of heart disease in the United Kingdom has not decreased at the same rate as in some other countries. One possible cause is that the NHS is mainly concerned with illness rather than health or preventative medicine. Responsibility for 'illness' is therefore largely centered on the DHSS, whereas responsibility for health matters involves a number of government departments including DHSS, MAFF, Sports Councils, Health and Safety Executive (for work), Department of the Environment, etc. Thus, translation of the research findings into government policy may well involve more than one government department which must make implementation more difficult.

(h) We are not aware of any specific system for training medical researchers which is any different from that for other research personnel. The main need is to ensure a buoyant and lively environment in which good research can be undertaken and which attracts and keeps suitable people. For whatever reason, this is not the current situation in our universities and research institutions.

(i) The evidence from Sir James Gowans to the enquiry in Civil R&D on the MRC indicated satisfaction by him with the current system. We believe that the MRC covers too great an area ranging from fundamental basic research (for example into the structure of DNA) to large epidemiological studies.

The effect of these highly disparate areas competing for funds within the same organisation is that fundamental research is receiving a high portion of MRC's budget. In scientific terms (for example the Laboratory of Molecular Biology) this has offered excellent value but has meant that the amount remaining for clinical research has been relatively less than is really required. We would support a reorientation of the responsibilities of the MRC and the SERC so that the SERC is responsible for all fundamental research in this country whether in physical or biological sciences and the MRC is responsible for clinical research. A new Research Council could be set up to be responsible for engineering and technology.

We would also welcome a clearer direction on the priorities of medical research in the United Kingdom but not at the expense of funding projects which are sub-standard—for example first priority for funding would be to those alpha + projects in certain agreed areas. These priorities should be reviewed on a five-yearly basis.

A mechanism should be set up to review results of research and to see where and how it can be used. Care must be taken to ensure that basic research with no specific identifiable outcome or use should also be continued: this should be done by the SERC.

An area not covered in your letter concerned the effect of regulations on clinical research and other activities necessary for the development of new pharmaceutical products. The requirement for increasing numbers of patients in clinical studies, the need of post-marketing surveillance studies and the desire to have more information on each case treated, have all imposed considerable burdens on both the pharmaceutical industry and the clinicians, general practitioners and hospitals with whom we work.

Regulatory authorities should be aware that there are only limited resources (in terms of hospital facilities and numbers of patients) to satisfy increasing requirements for information. One result is the clinical studies are becoming more difficult to set up and taking longer to complete.

Finally, it is worth remarking that centrally controlled economies (such as the USSR) have made no more advances than a decentralised one such as the United Kingdom. In the end, success is the result of the drive, enthusiasm and ability of the individuals involved and no amount of centralised direction can guarantee success. Thus, for success, the conditions and environment must be such as to encourage and motivate the individual and his/her team.

We would be willing to present evidence in person if the Committee so wishes and for your interest, we attach a copy of the Upjohn Company's Annual Report for 1986 and our brochure outlining Upjohn's activities in research and development.

M Jowett
Managing Director

April 1987

Letter from Richard Wakeford, Cambridge University School of Clinical Medicine

I wonder if I might write to you concerning the Committee studying medical research?

My particular field of endeavour concerns the development of medical education in its broadest sense—from selection, through devising appropriate curricula and teaching methods, to assessment procedures. Clearly, the effectiveness of health care delivery within the NHS is to a very substantial part dependent upon the effective selection, training and assessment of health professional personnel. Yet in many ways, medical education as practised in this country is traditional and arguably not as relevant as it could be to health service needs. (Examples are a failure to lay substantial emphasis on the skills of doctor/patient communication, health promotion and preventive medicine generally.)

There are few substantial examples of educational innovation in undergraduate medical education in the United Kingdom. Even the arrangements at Southampton Medical School whereby students receive early exposure to clinical medicine, particularly in general practice, were described to me by the foundation Dean as of motivational relevance only. Yet there is clearly much oportunity for experimentation, and evaluation of the results of this. One example would be the development of a community-based medical course, in which students would start by gaining an understanding of health in the community, and progress through a study of illness and its broader implications to a study of primary, secondary and finally tertiary health care.

The purpose of this letter is to remark that medical *educational research* is regarded as "nobody's baby". The Department of Health say that it should be a matter for the education ministry, which in turn says that it should be a matter for the health ministry. If your Committee agrees that it is an area in which experimentation and evaluation should take place, then perhaps they could consider some specific mention of it in their recommendations, and identify the relevant funding body.

One of my fields of interest is in the training of research clinicians, currently a matter of particular concern as young clinicians are increasingly uninterested in research careers. I enclose a recent paper from the Lancet, which may be of interest to your Committee [*not printed*]. However, some more recent work may be of more relevance, and I have asked the Senior Author on this paper, Dr David Evered, to get in touch with you.

April 1987

Letter from Professor P D Wall, University College London, University of London

I wish to reply to your enquiry about research in relation to the NHS. I will confine myself to the problem of pain which particularly concerns me in my own work and as editor of the journal "Pain".

There are three good aspects.

1. Cancer pain. The development of the hospice movement has led to a thoughtful and successful research and development and application of pain control measures. Britain has led this movement and has every right to be proud of the achievements.

2. Post-operative pain. The anaesthetists have done a very good job although in research they trail behind other countries.

3. Pain clinics. The numbers of these specialised clinics is rapidly expanding and they do a fair to good job in research particularly the groups in Oxford and Liverpool.

There are a number of very bad aspects.

1. The needs of the population outstrip the attention paid to them. This applies to the chronic pains of many adult conditions which increase with age and include arthritis, orthopaedic disorders, cystitis, peripheral nerve disease such as postherpetic neuralgia and central nervous conditions such as arachnoiditis and stroke.

2. The situation in Britain has deteriorated severely at the interface between basic and clinical research. Not so long ago we were world leaders with such giants as Sir Thomas Lewis and Sir Henry Head. As editor of an international journal I now receive very few papers from Britain in this area and they are mainly poor and trivial while the rest of the world expands its contributions rapidly.

The major reason for this I attribute to the immense pressures on doctors particularly in academic units to provide a day to day clinical service with little or no time or credit or support for serious research.

This has the effect of woeful ignorance on the part of these practising doctors about progress in the rest of the world which should be applied to their patients. It also results in patients being handled in a few minutes when days or weeks of trial and observation and treatment are needed. It also leads to an intellectual deadness with dogmatic approaches familiar in the Third World which we rapidly approach.

3. This deterioration of the basic-clinical interface has led to an isolation of basic research from the clinic. On the whole the basic research abilities are up to world standards but they drift off to more and more irrelevant topics. This applies to the pharmaceutical industry who also have to cope with the financial pressures to provide a quick profit which prohibits fundamental research. The pharmaceutical industry for the same reason can show little interest in conditions which only affect thousands in favour of more profitable possibilities offered by more common diseases.

I would ask the committee to consider the following proposals which apply to pain problems but also to all other clinical problems.

1. Restoration of the expectation that young doctors in academic clinical units will do genuine research at an international standard. This means that they should have time, support, facilities and credit. The Royal Colleges have a particular responsibility here to return to the old standards of requiring academic achievement and research production in those with consultant and professorial roles. This means that they must give credit for research and not as now regard it as an irrelevant hobby.

2. Better utilisation and encouragement and respect and education for the non-medically qualified health workers. Nurses, physiotherapists, midwives, etc. are falling far behind other countries in their education and responsibility and in the role they could play in research.

3. Consideration of the tax and pricing structure for the pharmaceutical and other medical industries so that they would finance in house or external grants to more forward basic research rather than to concentrate only on instant application.

4. Encourage the Medical Research Council to expand their excellent but limited policy of setting up working parties on particular problems. These working partaies need a formal structure and a realistic aim and a budget.

April 1987

Memorandum by Wandsworth Health Authority, St George's District School of Nursing

The School of Nursing at St George's Hospital subscribes to the philosophy that research constitutes a core of nursing practice and nurse education. We believe in the value of research, in that, the activities and findings of research are fundamental to change in thinking and in practice in nurse education.

In March 1985, the School sought approval from the English National Board for Nursing, Midwifery and Health Visiting to appoint an Educational Research Officer, with the following intentions:

Promoting the integrations of theory and practice in nurse education by carrying out research on the structure, process and outcome of nurse training and education.

Assisting the institution to implement and evaluate planned educational changes.

Creating a body of knowledge specific to nurse education.

In the light of the current recruitment position in this country, for both trained Nurses and 18 year olds for nurse training, and the increasing demands of the Health Service for scarce resources, the School is undertaking a number of studies in different fields aimed at improving standards of nurse education; the quality of life for people in the Health Service; and maximising the use of resources through reducing wastage and sickness and absence rates.

Particular questions, requiring investigation, are:

How learner nurses learn in the profession.

How they think and solve problems.

The type of learning strategies employed by nurse teachers and to what extent these learning strategies match the cognitive styles of students.

The dynamics of the learning environment in clinical practice.

The effectiveness of recruitment and selection procedure.

Why candidates reject vacancies, once offers are made to them.

Why learner nurses take sick leave.

Why students abandon their training.

Why newly qualified Nurses leave the National Health Service.

The effectiveness of time employed by Nurse Teachers.

The effectiveness of post basic nurse education.

Following the appointment of the Education Research Officer in September 1985, the School has instigated some studies. For example:

(1) The career choice of newly qualified Registered Mental Health Nurses.

(2) How students relate theory to practice in the Care of the Elderly setting.

(3) Continuing Education Needs of Qualified Nurses—the first stage of the research project has been completed. Findings of the research will be used as the basis for a longitudinal action research programme.

(4) A management research project is being undertaken by a part-time research assistant investigating the factors relating to sickness and absenteeism amongst different groups of student nurses studying for RGN and RMN qualifications. A number of research instruments will be applied, during this stage of research.

At subsequent stages, counselling will be offered to volunteers, whilst, at the same time, attendance records will be monitored. It is anticipated that this research project will be completed by January 1988.

(5) An Interactive Video research project is being conducted by one of the Senior Tutors, in conjunction with the Department of Management Sciences, UMIST, Manchester. The subject area is disability, focussing specifically on people suffering from rheumatoid arthritis and other forms of crippling conditions.

(6) The Educational Research Officer is undertaking a doctoral research programme in medical sociology. The subject is Infertility as a Blocked Status Passage, supervised by the University of London. The project studies the social consequences of infertility and the opinion of people on the service provided.

(7) A doctoral research programme is being conducted by one of the Nurse Tutors, investigating the reasons why learner Nurses and trained Nurses leave the National Health Service, using Kelly's Personality Repertory Grid as a way of eliciting their personal constructs of Nursing. The project is supervised by the Medical School at St George's Hospital.

(8) The Director of Nurse Education of the School is undertaking a doctoral research programme, supervised by the University of Southampton. The research programme will be completed in December 1988. It is a philosophical investigation, using a phenomenological approach, in an attempt to clarify the concept of caring.

October 1987.

Supplementary Memoranda by The Wellcome Trust

I am responding to your invitation of 29 July to supply additional evidence to your Sub-Committee.[1]

DENTAL RESEARCH

We too have a general feeling that dental research is not strong but have no positive evidence to back up this perception. We fund dental research as part of the Trust's Clinical Programme. There are seven current grants, total value £0.5 million. We believe that the strongest department is the Department of Basic Dental Sciences in Manchester where the Professor is keenly interested in applying basic science to the solution of clinical problems.

NURSING RESEARCH

The Trust does not fund nursing research.

CAREER PROBLEMS

It is not clear whether the problem of careers mentioned in your letter relates to medical graduates or scientists. If medical, there are two major problems affecting careers. The requirements for higher medical training laid down by the various Royal Colleges are increasingly restrictive and a major impediment to the development of research minded clinicians. This is a problem for the profession itself. Secondly, we are increasingly concerned at the effect on clinical research that will result from the activities of the Joint Planning Advisory Committee (JPAC) of the DHSS. A quota of honorary senior registrar posts has been laid down for appointments made by the Association of Medical Research Charities (AMRC), a number arrived at without an accurate knowledge of the number of medical graduates funded by the ARMC at this status. It is clear that this quota, if rigidly interpreted and acted upon, will seriously impair the use of the increasing funds available for medical research through members of the AMRC and thereby reduce the number of clinicians involved in research.

SHORTAGE OF POST DOCTORAL SCIENTISTS

We highlighted this problem in our original written and verbal submissions to you. We first became aware of difficulties in recruitment about five years ago, initially in immunology and molecular biology but now the problem has rapidly increased with time across many fields. In an attempt to help with this problem, the Wellcome Trustees recently decided to allot £1.0 million per annum over each of the next three years to fund a total of about 100 special studentships. These studentships will be funded at a somewhat higher level than MRC students, to try to attract good quality graduates into research. We believe the decision to reduce the number of PhD studentships funded by the MRC and the low level of the PhD stipend are serious impediments to recruitment of basic scientists.

P O Williams
Director

September 1987

A new aspect of the support of research by the charities has arisen since we gave evidence to your Sub-Committee.[1] It is about the payment of overheads by charities to universities in addition to their direct contribution to the support of research.

The position is, at present, that medical research charities which provide research grants in response to requests from universities pay for only the direct costs; staff and research expenses (equipment etc.). They assume that the universities are basically funded so as to be able to absorb these grants (though there is a potentially different position if research is commissioned and the university is asked by a charity whether

[1]Printed in Volume II p38.

potentially different position if research is commissioned and the university is asked by a charity whether it wishes to undertake research). This situation has been maintained by the dual support system of the universities. It exists because the UGC and the MRC recognise that the charities play such a significant role in the support of research in the universities that the funds they provide would have to be replaced by government if they were not forthcoming from private sources.

Assuming this to be the case we would like to indicate to the Sub-Committee the effect of a 40 per cent overhead charge on charitable support of university medical research. The AMRC will have available figures for all the membership of that organisation including ourselves. We regard the matter as so serious, however, that we have decided to write you separately.

Assuming that overheads amount to 40 per cent of the total monies awarded to universities and medical schools then (and using 1986–87 as the base line) we would have to reduce our support from £31.5 million to £22.5 million—the effect of this £9 million a year reduction would be either:

(1) a reduction of 500 in the number of people supported by the Trust, or

(2) the complete cessation of all support for Mental Health and Neuro-science, Tropical Medicine and Infectious Diseases and Veterinary Medicine, or

(3) the reduction of 50 per cent in the Trust's total *ad hoc* grants budget.

If the MRC had to take over support of these people then of course it would cost them not only the overhead but also the basic cost.

It is also worth pointing out that there is no *obligation* on this Trust to support research in the universities; in common with other charities there could be a tendency to follow the approach of the Imperial Cancer Research Fund and set up our own independent research establishments. Since we would have to pay 40 per cent extra on grants to universities the full cost in our own independent laboratories would not be much greater and in compensation we would retain the property rights of our establishments and the discoveries arising from the research we fund.

I hope this will be of use to you. We look forward to seeing the report.

P O Williams
Director

January 1988

Letter from the Wellington Foundation

Thank you for asking me to give evidence to the Sub-Committee on Medical Research. This is a vital area of work and one to which the private sector of medicine is making a contribution in various ways.

My main involvement is through three charities of which I am a Trustee. Firstly, the Wellington Foundation which I established at the same time as I opened the Wellington Hospital. The Foundation was formed to promote post-basic medical and nursing education and research and to give the private sector the opportunity to "put something back" into the NHS in this respect.

Over the years we have sponsored research projects on a wide variety of topics, but all having in common a direct relation to improving patient care. Initially awards were made to doctors, but more recently there has seemed to be a greater need to support nursing research. Projects we have made grants to include a study on the role of electro-magnetism in promoting the healing of pressure sores, the "Know Your Midwife" scheme, and a study of new methods of assessing pain in children.

Many nurses studying for a Master's degree have applied to us for funding. This reflects an important move towards a more academic approach to the nursing process, though nursing research is still relatively young in this country. In consequence of this, there is, as yet, no central organisation to coordinate nursing research projects and to evaluate and field-test existing research findings.

This has led the Trustees of the Wellington Foundation to set up a new charity, the Foundation of Nursing Studies (FNS), which may be familiar to some members of your Committee. I enclose copies of the Consultative document, from which you will see that the FNS will be a major national resource for the nursing profession. Its need has been recognised by the Presidents of the Royal Colleges of Nursing, Physicians and Surgeons and by the DHSS.

My other involvement in the support of research projects is through the Charles Wolfson Charitable Trust, one of whose aims is "the encouragement of medical and surgical studies and research". Projects

we have sponsored include a major study on mental ill health among the aged, being conducted by Sir Martin Roth in Cambridge, the "Save a Baby" campaign at St Mary's Hospital, Paddington and the work of the Rehabilitation and Medical Research Trust.

As Medical Director of the Humana Hospital Wellington, I am pleased to say that the Hospital is a recognised centre for the Medical Research Council's Sarcoma Tumor Panel and our Head of Pathology Services is a member of the Panel. This is a long-term research project which has been running for three years so far and is expected to last at least another five.

I feel that the major areas of research which need continuing support are cancer, heart disease, acute psychiatry, ageing and dementia, arthritis and, of course, AIDS.

As far as your specific questions are concerned, (e), (f) and (g) relate directly to the work of the FNS. Leading members of the medical and nursing profession feel strongly that, as far as nursing research is concerned, the results are not adequately disseminated and that there is definitely duplication of research effort. Many nursing research findings are not translated into improvements in patient care, as the mechanism for spreading these findings does not exist. At best they may be implemented in the hospital in which the research was originally conducted and sometimes taken up by other teaching hospitals. However, smaller hospitals and those with no access to a teaching unit seldom hear of such developments until much later, if at all. It is, of course, to remedy this situation that the FNS has been established.

It is my own observation that problems of duplication also arise in medical research. There is a lack of coordination, and research on similar subjects is being carried out in various parts of the country with very little, and sometimes no, consultation between the researchers and organisations involved. For example, research on melanoma, which has important implications, is being carried out in three centres. The groups are pursuing similar overlapping objectives with no uniformity in their protocols. Their interests are regional and the largest centres of population are not included in any of the studies. A national investigation on this topic is needed.

It would be of great help in the charitable funding of research to set up a coordinating body, so that the Trustees of various charities, who might jointly sponsor a project, could be brought together. This would lead to easier funding of major work and is something which could be undertaken by one of the existing organisations.

I hope this is of use to the Committee and should be pleased to help you in any other way that I can.

Dr A Levin
Chairman
The Wellington Foundation

December 1987

**Letter from Professor P N T Wells,
Bristol General Hospital**

Like many of my colleagues, I have for several years been anxious about the support for medical research in the United Kingdom and a recent development, of which I have become aware as a Member of the Cell Biology and Disorders Board of the Medical Research Council, has made me become despondent. The Government has decided not to supplement the grant-in-aid to the MRC to meet the recently agreed pay award for non-clinical scientific staff. In itself, the pay award is, of course, timely and welcome and it is a disappointment that there is no prospect of a similar award being made to non-clinical scientific staff employed in the National Health Service.

The point that I wish to make in this letter, however, relates only to the fact that MRC grant committees are now being forced to make judgements between applications for support for research of such excellence that discrimination between them has become impossible. Although it is tempting to resign from the Cell Board when faced with this situation, I am reluctant personally to do this because I believe that it is only by protesting that there is any possibility that the position may be ameliorated. I cannot emphasise too urgently the diastrous effect that the Government's policy is having on British science; I am sure that this will be recognised by you and your Committee and I hope that you may be able to persuade the Government to change direction in this field so vital to the interests of the nation.

March 1987

Memorandum by the Welsh Office, National Health Service

SUMMARY OF PRESENT ARRANGEMENTS

1. The Welsh Office arrangements for health and personal social services (HPSS) research fall at present into the following channels:

(a) the mainstream HPSS research programme, which is conjoint with that of DHSS, making up a single England and Wales HPSS research programme. This is the main vehicle in both countries for the support of service related research into the health and personal social services. It commissions a number of major and minor research initiatives, at an annual cost of some £12.3 million, of which some £561.9 thousand relates to support for Welsh Office projects (latest figures). The programme is managed by the Office of the Chief Scientist (CS) of the DHSS;

(b) there is a small budget for Operational Research and related projects, held and managed by the Welsh Office. The provision for this was £54,000 in 1986–87. The bulk of these funds are channelled through UWCM to university researchers engaged in a wide variety of project areas. The effects of psychotropic drugs, impact of demographic change or health service needs, local attitudes to health facilities and cost effectiveness of treatments are all areas which have been or are being explored with assistance from the budget. The average level of grant is about £15,000 per annum over two or three years and the Welsh Office allocates resources for particular projects in the light of advice provided by professional colleagues within the Department;

(c) additional Welsh Office funds have been made available in support of ad hoc initiatives relating to responsibilities of professional staff of the Welsh Office, for example epidemiological research, human genetics (£20,000 in 1986–87);

(d) the Welsh Scheme for the Development of Health and Social Research, which is similar to the Locally Organised Research schemes of the English regional health authorities. It is managed on an agency basis by the University of Wales College of Medicine. (£367,000 in 1986–87).

Main HPSS Programme

2. Proposed additions to the research programme from the Welsh Office or elsewhere are submitted to the DHSS with an indication of the priority and degree of support which the Welsh Office wishes to attach to each item. The Welsh proposals are then considered along with those from England, being examined first in a Research Liaison Group. It was agreed in 1981 to account separately for Welsh R&D projects in the HPSS programme and to charge these against a national fund of 5.6 per cent of the total HPSS research budget (this proportion being based on the respective populations of the two countries). In recent years the outcome has been support for researchers in Wales at a level approaching the agreed notional "Welsh proportion" (5.6 per cent) of the total joint HPSS budget.

			£000s
Year	*1983–84*	*1984–85*	*1985–86*
Total HPSS research Final outturn	11,483.1	11,209.5	11,351.0
Welsh items	457.9	415.3	590.0
Welsh items as percentage of total	4%	3.7%	5.2%

3. Most of the expenditure in Wales goes at present on three major programme grants. In each case the financial and administrative arrangements for management of these rest with the Office of the Chief Scientist.

4. Under present arrangements, the responsibilities of the Chief Scientist DHSS extend equally to Wales. Successive holders of the post (as part of their supervision of the England and Wales programme as a whole) or their deputies have headed the "Chief Scientist vists" (in which Medical Research Council representatives also participate—see para 10 below) for periodic appraisal of the three programme grants running in Wales. Such appraisals are an essential quality-control check on long running programmes.

The Welsh Scheme

5. The Welsh Scheme exists "to foster the research spirit in the health professions which is conducive to a high standard of practice; and to facilitate the discovery and encouragement of local talent". The scheme applies to "suitably qualified medical, dental, scientific and technical, nursing social science, pharmacy, physiotherapy and other para-medical personnel, and to general medical, dental or other practitioners" who are in contract with a health authority for the provision of service. It is administered by the University of Wales College of Medicine for the Welsh Office under an agency arrangement.

6. Projects qualifying for support may be biomedical (generally clinical) research or research directed to the improvement of the operation of the health service. The financial limit for any one research proposal is currently set at £27,000 and the maximum duration is usually two years. (Exceptionally projects may

be supported for three years especially where a postgraduate student is pursuing a higher degree.) Research proposals are considered by an Advisory Committee, the members of which are appointed by the Secretary of State following nominations by health authorities, the University of Wales and the Medical Research Council. The Committee meets three or four times a year to consider applications for research grants.

	1982	*1983*	*1984*	*1985*	*1986*
Applications/re-applications received	51	51	60	71	81
approved	30	20	20	34	35

7. Improvements to the Scheme to increase its availability and breadth are currently being implemented by the Advisory Committee.

— to encourage novices to participate and reduce the involvement of senior personnel;

— to encourage joint research between the University of Wales College of Medicine and non-teaching district health authorities;

— to extend the scope of the Scheme into new areas by offering guidance to health service staff on research methods.

Medical Research Council

8. The Medical Research Council (MRC) is an independent body incorporated by Royal Charter and funded by Parliament via the Department of Education and Science. Its purpose is to promote the balanced development of medical and related biological research. The Council employs its own research staff and also provides grants for other institutions and for individuals who are not members of its own staff, thus complementing the research resources of the universities and hospitals. The Council makes it decisions on merits and without regard to intra-national boundaries; there is at present only one MRC unit in Wales, that for Epidemiology, located in Cardiff.

9. The research needs and interests of all health departments are strengthened by close collaboration with the Medical Research Council (MRC). The arrangements for cooperation between the health departments and the MRC are governed by a concordat which provides a framework within which the MRC meets the health departments needs for biomedical research and contributes to the strengthening of the base for health services research. The MRC supports biomedical research from its DEF grant-in-aid on health service research in accordance with objectives identified by DHSS and agreed with the Council. The sum involved in 1986–87 was £2.7 million. In addition the concordat provides for the health departments to commission bio-medical research elsewhere, funded from their own research budgets if they so wish, and for the Council to undertake specific commissions in health service research.

10. Under this concordat, MRC officials are invited to accompany the Chief Scientist's visits to the DHSS research directors, including those in Wales.

11. An annual high level meeting between health departments and the MRC to discuss the concordat and the progress made has been agreed.

12. In 1986 the MRC set up a committee to act as a focal point for health service research with a budget of £150,000.

Memorandum by the Welsh Scheme for the Development of Health and Social Research

Background

The WSDHSR is funded by the Welsh Office and administered by the UWCM. It exists to foster the research spirit in the health professions which is conducive to a high standard of practice and to facilitate the discovery and encouragement of local talent. The Scheme is open to suitably qualified medical, dental, scientific and technical, nursing, social science, pharmacy, physiotherapy and other paramedical personnel who are in contract with a health authority for the provision of service. The annual allocation is approximately £400,000.

Research proposals are considered by an Advisory Committee, the members of which are appointed by the Secretary of State for Wales. The financial limit for any one research proposal is currently set at £27,000 and the maximum duration is usually two years.

Priorities

The Advisory Committee is currently reviewing the criteria which it uses to accord priorities to research applications. It has always given special consideration to proposals coming from (a) neophytes in the research field (b) centres outside the Teaching Hospital and has endeavoured wherever possible to encourage and support them. However, in recent years there has been an increase in the volume of applications from experienced senior workers in all branches of medicine and the related disciplines. This is probably due, in part to the increasing difficulty in finding resources to support such work from the Research Councils.

Allowing for the point made above about newcomers the principal criterion and hence the main guideline to priority is scientific quality of the application as judged by the Advisory Committee with the help of external referees.

The revision of guidelines is therefore likely to be in terms of strengthening the claims of newcomers to research upon the limited resources of the Scheme in the face of increasing competition from established workers. This would, of course tend to reduce further the funding available for scientifically valid proposals of high quality.

The Need For Tenured Research Posts

Many young workers who embark on a piece of research pursue this for a limited period of time and, hopefully learn a great deal which will serve them well later perhaps in their clinical careers in the understanding and evaluation of reported research in the literature.

Others, however may be stimulated to aspire to devote a much longer period of their career to medical or paramedical research. At present they are likely to be daunted by the clear difficulty in obtaining posts in full-time research which offer any prospect of tenure. This is an issue which the Research Councils, the Health Departments and the large charitable foundations must address.

A Research Institute for Wales

Advisory Committee members are aware of the existence in Wales of a corpus of high quality workers, based notably in the UWCM who wish to engage in research enquiries for periods which exceed the time limits imposed by the Welsh Scheme and who are frustrated by the increasing difficulty of raising money through the Medical Research Council.

In any major redeployment of resources embarked upon by the MRC we would suggest that consideration be given to setting up a Research Institute in Wales which would provide space for a number of research endeavours to be mounted in various disciplines. The "mix" of these programmes could, with advantage be varied from time to time to meet national Welsh medical priorities and also to dovetail with the emergence of particular lines of research expertise which need special and continuing support.

Research in General Medical Practice

A particular problem arises in conducting research in the area of general medical practice. Ideally the researcher should be an active member of the primary health care team. However the career structure in general practice militates against this because once established as a Principal the doctor has great difficulty in maintaining an active research interest without financial loss. Ways in which this problem might be met should be explored.

Striking a Balance

The Select Committee has expressed interest in the bias that funding bodies may introduce into the pattern of research undertaken in the United Kingdom and ways in which health service needs may be met. There is no doubt that charities and drug firms support research in fields of interest or of value to them, and that it falls to governmental organisations to see that a balance is maintained and that research of long-term possible benefit and research of practical value to the NHS is supported. We believe that a higher proportion of the NHS budget than at present should be spent on research both operational and basic and that more of this should be spent at the Regional level in England and in Scotland and Wales, where the problems of providing a service to the community at a DGH level can be balanced with the need to foster research in collaboration with a university centre.

Letter from the Wessex Regional Health Authority

I am replying to your letter of 17 November 1987 concerning expenditure within this Region on Management Consultants, and I must apologise for the delay.

I set out below details of payments made during the current financial year in respect of Management Consultants employed in medical areas of research.

Expenditure 1987–88	
Performance Standards—Quality Assurance	£36,000
Cardiac Review	£ 2,000
Theatreman Computer System—Installation and review	£23,000
Ambulance Service Network Link—Software development	£ 6,000
Consumer Research	£ 6,000
	£73,000

I hope the above information is sufficient for your purpose.

H W Carstairs
Finance Manager

February 1988

Letter from West Midlands Regional Health Authority

I refer to your letter of 3 March 1987 addressed to Mr Ackers concerning the enquiry of the above Sub-Committee of the Select Committee on Science and Technology.

Where clinical research is concerned this Authority's effort is directed more towards the encouragement of research workers than to any particular field of research or of Health Service requirements. This is not to say that health priorities are ignored, but the Regional programme of support for Research projects that hold considerable promise yet might not obtain support from national grant-giving bodies, is essentially a policy of underpinning biomedical research by ensuring that promising research workers are given timely support.

As far as non-clinical research is concerned, projects are sought which relate to issues such as factors influencing demand for health care; the needs of client groups requiring care rather than cure; the optimum allocation and the use of manpower and financial resources; choosing priorities; personnel issues and the broad field of health service management generally. Encouragement is given to "first time researchers" with a competent supervisor being identified.

The methods of disseminating results and avoiding duplication of research effort are the same as those used elsewhere—scientific publications, and checking that intending research workers are aware of relevant research in the field.

Angus McGregor
Director of Planning/Regional Medical Officer

May 1987

Memorandum by the West Midlands Regional Health Authority, Hospital Infection Research Laboratory

The Regional Health Services Infection Research Laboratory was originally set up as a sub-unit of the Medical Research Council Industrial Injuries and Burns Unit and is financed mainly by the West Midlands Regional Health Authority with some MRC support. The original function was to investigate infection problems in the West Midlands, but this was extended to studies of national problems. It is also a WHO collaborating centre. It has a small staff consisting of a Medical Director, six technicians, an Infection Control Nurse and secretary. Comments on specific questions are as follows:

1–4. The work of the laboratory is provided by the Department of Health and Social Security, Regional Health Authority and Industry. It also plays an important role in controlling infection in the West Birmingham District. The senior member of staff are on BSI, DHSS and committees of professional organisations and priorities are based mainly on the requirements of these committees and of industry. Although this appears to work, in practice a national coordinator or existing committee for example the DHSS microbiology advisory committee, could collect information, coordinate studies to avoid duplication, decide on priorities for the unit most appropriate for carrying out the work and provide necessary funds if required. Funds are usually available for urgent and politically important studies, for example on AIDS and Legionnaires disease, but long-term projects, for example development models of factors for predicting risks of infection which would enable a more precise use of existing resources, are more difficult to find.

The MRC, charities or industry are unlikely to support such projects. Multi-centre trials would answer many important questions but still require central coordination. The MRC hospital infections committee was involved in such projects in the past, but has now been disbanded and the MRC is now unlikely to fund their projects. There is still a need for a limited number of units such as ours with well-trained staff that can respond immediately to new problems. However, responsibility must be well-defined to ensure that the most useful projects, both short and long-term, are carried out and that time is not wasted.

5. Dissemination of results is obtained through official publications, publications of professional societies. There is a problem of disseminating consistent information rapidly, for example a number of committees have been involved with AIDS advice which has often differed, confusing the recipients. This could be improved by an expert central coordinator. The other problem is to ensure advice reaches the appropriate audience, that is domestic staff do not read professional journals. Publication in relevant journals, for example hospital engineering and producing teaching material (usually with help from industry) has been reasonably successful.

6. Duplication of research is common when similar problems are arising in hospitals at the same time. It is important that contact is maintained with others working in the same area. Rapid dissemination of information would also be helpful.

7. Improvements in patient care have followed in our studies. The publication of two books: 1) Control of Hospital Infection, 2) Hospital-Acquired Infection—Principles and Practice, both of which are widely used, has been particularly valuable. The production of tape-slide talks and slide libraries (financed by industry) has also been useful. The problem is that teaching, production of teaching material and general dissemination of information takes considerable time, detracting from the research required to produce the information.

8. There is a need to identify current problems and keep a flow of information to the researcher as to what problems are relevant. The approach to problems often requires a multi disciplinary approach which in turn requires a greater knowledge of the organisation and what resources are available. Teaching coordination and organisation skills is neglected as is training in resource management. Communication skills need to be taught, scientists often interface badly with the general public and lack the will or the skill to counteract information disseminated by pressure groups which present them in a bad light.

The reduction in units by the MRC, particularly in practical areas, such as burns research, is heading to an absence of skilled technical and scientific staff. Scientists and technicians who have been working in one field for many years are invaluable but under existing conditions are likely to disappear.

9. The research worker looking for funds is often not aware of all possible sources of funding and those looking for solutions to problems are often not aware of what work is being carried out elsewhere. Some form of central brokages to bring the two together, would help.

As problems arise they are often investigated on an *ad hoc* basis by a wide range of people. The results produced may be of a very variable standard. Coordination of these small projects so that results could be used in a cumulative manner, even possibly stored on the same data base, could bring quick and more reliable answers to some problems.

This has already been discussed to some extent, but the provision of more well-trained research groups which can cope with practical problems in the health service would be desirable. The present system of putting in for project grants which are then reviewed and priorities given on scientific merit, means that useful practical projects of value in patient care will be lost.

Letter from Professor G K Wilcock, Department of Care of the Elderly, University of Bristol

Thank you for writing to the Alzheimer's Disease Society asking for evidence for submission to the sub-committee. The Alzheimer's Disease Society itself does not carry out research to any great extent, and your letter has been forwarded to me as Chairman of the Medical and Scientific Advisory Panel. It would probably be most useful if I responded on the basis of my own unit's research. I will describe this first and then address your nine questions specifically.

My unit was established three years ago in Bristol, and I am the first holder of the Chair in Care of the Elderly. The Department's main research ethos is to develop research into the conditions that particularly effect the quality of life of older people. Initially we have concentrated on dementia, but are at the moment fostering links with other departments within the University that have hitherto not used their expertise in the field of ageing. This is a potentially fruitful area as inter-disciplinary and interdepartmental collaboration stimulates all involved. As far as the dementia research is concerned, this falls into three main categories. On the one hand we have established a clinical research unit running a memory disorders clinic which services Bristol and also receives referrals from all over the United Kingdom. This is run essentially on

short term funds obtained from outside the Health Service and which are in constant jeopardy. Putting aside the service element of the clinic the research committment concerns evaluating the natural history of different types of dementia, improvement of the techniques for diagnosing the type of dementia, and developing different therapeutic approaches.

We also run a small neuropathology laboratory, converted from a seminar room, in collaboration with one of our local neuropathologists. This lab, which also has tenuous funding, is looking into neuropathological aspects of the dementias, particularly Alzheimer's Disease, and is also essential for processing material for the third aspect of our research. The latter is a neurochemical/neurobiological unit that we have established in the Department of Medicine laboratories in the BRI. My colleagues in this department are researching into Parkinson's Disease as well as the dementias, and again we probably spend half our time looking for funds rather than undertaking research. In this unit we are investigating neurotransmitter related issues and also have a programme of experiments involving the transplantation of foetal material into the brain.

At a collaborative level with other disciplines we have established links with the Department of Orthopaedic Surgery, the Department of Rheumatology, the Department of Anaesthetics, and the University Department of Social Work as well as with medical scientists at the University of Bath. All this work is hampered by lack of financial resources and the availability of only short term funding for any given project which results in research workers being tempted to leave for another post before the tenure of their existing one is necessarily up. Research in my department, as in various others in this country, desperately needs tenured posts.

I will now take your points in turn.

(a) I am not sure how priorities for medical research are set at a national level other than the occasional directive to the research councils. I suspect that each funding body decides its own priorities. At a departmental level we have decided to tackle those problems that particularly effect the Health Service, hence the spectrum of research interests described above.

(b) I personally do not regard the present balance between different branches of research as being correct. It would seem sensible to me to have a national set of priorities, and those diseases that are commonest, cause a significant degree of debility, and have a major financial impact should be given higher priority than others. This would include many of the problems of aging but I appreicate that there are many valid competing claims in other areas.

(c) Priorities in medical research are changing in relation to the issues you mentioned, but far too slowly. The United States and Canada are years ahead of us.

(d) The policies adopted by the institutions through which research is funded are put together by individuals. Many of these have vested interests which are quite naturally reflected in the advice they offer.

(e) Yes I think the results of research are adequately disseminated.

(f) There is very little unnecessary duplication of research efforts.

(g) The medical profession is naturally conservative but in general I believe the benefits of research eventually become translated into improved patient care of health education. There are some areas where this is painfully not so, for example dietary advice and the incidence of coronary heart disease. This is partly the result of the approach of the medical profession and partly the attitude of the public in general.

(h) Until there is a proper career structure for medical researchers in many instances their priorities will depend very much on the availability of funding.

(i) The answer to this question is very definite yes. The current approach to funding and administrative organisation of medical research is a shambles.

Thank you for giving us the opportunity to comment.

April 1987

Letter from Wyeth Research (UK) Ltd

Your letter of 3 March addressed to Dr M Cohen has been forwarded to my office for reply.

The Wyeth research group, while independently controlled and directed, recognises that it is to a certain extent part of a much greater corporate whole. Nevertheless, it is of a sufficient size (around 150 scientists) and diversity (it covers chemistry, pharmacology, pharmacy and clinical pharmacology) to allow valuable innovation under its own aegis.

The answers given below relate to the headings in your letter but reflect my views alone and not those of my company nor any colleagues. Having said that, I like to think that the views expressed are not inharmonious with the opinions of the United Kingdom research based pharmaceutical industry as a whole.

(a) The research priorities of Wyeth Research (UK) are set mainly on the basis of the scientific competence of the individual scientists who work for us. In our case we direct our work mainly towards the improvement and cure of diseases of the central nervous system. Since we believe that the needs of the National Health Service reflect those of society at large, and to that extent represent a commercial benefit, any work we do must, by definition, acknowledge the link existing between ourselves and the NHS. The economic nexus which identifies the NHS as a monopsonistic purchaser of the results of our research motivates and directs the priorities we set and the areas we explore.

(b) The balance between different branches of research can never be "right". At best it can only be adjudged the best possible. Thus, in our case, with limited resources, we make no attempt whatsoever to be in critically important fields such as cancer or virology simply for lack of competence. This decision is easily made insofar as our sister company in the USA is active in both these areas. If we were to be afforded increased resources—and such was very much a possibility prior to the government's decision arbitrarily to introduce the so called limited list then, undoubtedly, consideration would be given to enter other fields of research.

(c) The pharmaceutical industry responding as it does to market forces, will respond dramatically to changes in disease incidence, population structures and (particularly) to new technology. Indeed, it is the last aspect which often determines the nature of the research work undertaken since only when the science is "right" can advancement be made. This, of course, reflects the determined interest of industrial companies in ensuring that part of their research is in front-line innovation, designed to explore new technology.

(d) From observation, the public and charitable funding of research leads more to the exploration of novel technology rather than to its application. This does not mean that the loss of such funding would mean no such exploration would ensue: in the field of drug discovery, industry would undoubtedly shoulder the responsibility. Having said that, the benefits to the nation of providing means to undertake such preponderantly academic inquiry from the public and charitable purse are clearcut.

(e) In my opinion the results of research are adequately disseminated. Very occasionally, an industrial research group will defer publication for patent reasons but such delays are brief. Given the all consuming interest in new drug discovery and the plenitude of journals and Societies (such as the Society for Drug Research, the British Pharmacological Society and the Biochemical Society) early awareness is the norm. Also the natural interplay of motivated scientists and their interest in each others' work leads to prompt dissemination of major discoveries.

(f) Duplication of research is usually avoided by keeping abreast of the literature. However, it would be foolhardy to suggest duplication never occurs. But modest duplication is frequently the price paid for promptitude and competition and as such should not be grudged.

(g) No suitable industrial research group could survive if the work it does is not reflected in actual benefits to society. For those academic units where the work undertaken appears divorced from such benefit (one might cite Fleming's work on lysosyme at St Mary's Hospital, Paddington in the 1920's), history may serve to readjust one's immediate perceptions or criticisms.

(h) I cannot propose any changes in training *per se*, but I would suggest that society in the United Kingdom today is ill-served in its attitude to science in general. That the brightest of our students should move to accountancy and business administration rather than to seek a career in science is, to me, lamentable. The nation needs good science if it is to survive and prosper and to that extent it should actively (and, if need be, differentially) support science teaching in secondary schools to encourage greater interest by undergraduates in such disciplines.

(i) I would support both an increase in central funding of research (both pure and applied) and its redirection away from "big science" (such as CERN and astronomy) towards areas where we have, as a nation, excelled in earlier times. Specifically, I have in mind increased support for university centres of excellence in the basic sciences: physics, chemistry, biochemistry, physiology and pharmacology. If necessary, such support could be funded directly from a subvention from "research based" industry in the United Kingdom on a global basis. Too much reliance is placed upon the self-interested generosity of specific companies seeking academic liaison. While this is good in itself it cannot serve to replace a formal funding mechanism spread industry-wide and divorced from special benefit.

I do hope the views expressed above are of value to you. If you would like me to enlarge on any point please feel free to contact me again.

Dr J F Cavalla

March 1987

Letter from the Yorkshire Regional Health Authority

EXPENDITURE ON MANAGEMENT CONSULTANTS AND COMMERCIALLY COMMISSIONED MANAGEMENT INFORMATION

I refer to your letter of 17 November 1987 on the above subject, and to your recent conversation with Mr Wallis.

While some £400,000 has been spent on management consultants within the last two years, there has been no expenditure which can be specifically linked to medical research or to activities within the medical field.

The major activities covered by the above sum were:

(i) Competitive Tendering

(ii) Review of staffing levels (non-medical)

(iii) Review of the role of the RHA/Members

(iv) Review of Personnel and Manpower Information Systems/Computing Strategy

(v) Development of strategic plans

(vi) Costing and funding of regional specialties

(vii) Value for Money exercises (non-medical)

No doubt you will contact me if you require any further information.

M E Calvert
Deputy Director of Finance

December 1987

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Dr J F [illegible]

March 1987

Letter from the [illegible] Regional Health Authority

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M F [illegible]
Deputy Treasurer of Finance

December 1987

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